

Vascular plants of Punta Ballena: dataset for conservation of an endangered hotspot from Uruguay

Patricia Mai¹, María Zabaleta², Laura Cappuccio¹,
Antonella Pollero¹, Eduardo Marchesi²

1 *Departamento de Ecología y Gestión Ambiental, Centro Universitario Regional del Este, Universidad de la República, 20000, Maldonado, Uruguay*

2 *Departamento de Botánica, Facultad de Agronomía, Universidad de la República, 12900, Montevideo, Uruguay*

Corresponding author: Patricia Mai (patimaimo@gmail.com)

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Abstract

Punta Ballena is the coastal southern tip of the Sierra de la Ballena, a shear zone of two tectonic plates, located at the beginning of the oceanic coast of Uruguay. Coastal rocky points are especially relevant because of their high plant richness, moreover their vegetation is endangered mainly due to the high tourist – urbanistic development of the coast. This study aimed to determine the list of vascular plants occurring on Punta Ballena coastal rocky point and identify its vegetation communities. Also, to identify endemic species, threatened and of interest for conservation species; and to analyze the species historically documented for the site. Punta Ballena stands out for its remarkable species richness with 427 species, dominated by Asteraceae (82), Poaceae (82) and Fabaceae (26). Five vegetation types were found in the natural area, which allows the combination of species with different adaptations. The site supports five vulnerable species and one endangered species (IUCN), 33 priority species for conservation, two local endemisms and numerous national (13) and regional (45) endemisms. Regarding historical collections, to date Punta Ballena has suffered a loss of 14% of its species, this is likely a direct consequence of the recent urban development. From these historically documented species, we consider five of them to be locally extinct. Due to these overwhelming results, we consider the site a diversity hotspot on the Uruguayan coast. It becomes urgent to generate conservation plans that allow the maintenance of the flora and vegetation communities that are still preserved in the area.

Keywords

coastal rocky point, endangered site, endemisms, historical collections, local extinctions, species list, threatened species, vegetation types

Introduction

The Uruguayan coastline has an extension of 473 km on the la Plata River and 233 km on the Atlantic Ocean (Goso et al. 2011), along which a great diversity of environments such as rocky points, beaches, dune fields, lagoons, psammophilous shrublands and forests have developed (Alonso Paz and Bassagoda 2003). This diversity of environments supports a great floristic richness, with estimations of about a third of the country's flora species present in a 10 km-wide coastal strip (Alonso Paz and Bassagoda 2006). Among these environments, rocky coastal points are of special relevance because of their high plant richness and particular species composition.

Geologically, the estuarine and oceanic coast of Uruguay shows a great diversity of rocky materials and sediments; where coastal rocky points show a varied geological evolution (Goso and Muzio 2006). Vegetation associated with coastal rocky points is adapted to the environmental stress conditions given by the oceanic influence, such as strong winds, wave action, high salinity levels and permanent insolation (Chebataroff 1942, 1950; Alonso Paz and Bassagoda 2006). Among the numerous rocky coastal points on the coast of Uruguay, only two of them have previous studies that describe their flora and vegetation: Cabo Polonio (Delfino and Masciadri 2005; Masciadri et al. 2006; Picasso and González 2015) and Cerro Verde (Alonso Paz and Bassagoda 2003), and both are protected areas included in the National System of Protected Areas (IMPO 2021). Punta Ballena has been highlighted as a site with high plant diversity in technical reports (Bonifacino s.d., Rodríguez-Gallego et al. 2008) and was proposed as a relevant remnant patch of coastal vegetation (Puppo et al. 2020).

Vegetation occurring on coastal rocky points is exposed to alterations and threats due to the high tourist – urbanistic development that the coastal strip has been experiencing for decades (Alonso Paz 2005; Delfino and Masciadri 2005; Marchesi et al. 2013). Additionally, in these environments, the extraction of plants mainly due to collectors or for ornamental purposes affects their populations (Marchesi et al. 2013). Moreover, Fagúndez and Lezama (2005) considered the vegetation associated with coastal rocky points to be in need of conservation, due to their low occurrence and their presence on reduced surfaces, and suggested that their persistence is seriously threatened unless urgent measures are taken for their protection.

In view of the scarce previous research and the rapid degradation of this unique ecosystem, the aim of this study was to generate a list of vascular plants found on the coastal rocky point of Punta Ballena and to identify their plant communities. In order to contribute to the development of conservation plans, this work sought to identify species that are endemic, threatened and of interest for conservation, as well

as analyze the species historically documented at the site, and evaluate which ones are still present and which ones are extinct. The complete plant species list with life form assessment, type of record and reference voucher, vegetation type where each species occurs, geographic origin, conservation status and endemism information is detailed.

Materials and methods

Study area

Punta Ballena is a locality whose identity is given by a rocky coastal point. It is located in Maldonado Department (-34.9132°S , -55.0458°W ; Fig. 1A), 12 km west of Punta del Este, the most important touristic seaside resort in the country. This rocky point extends into the outer estuary zone of the la Plata River, which is highly influenced by the Atlantic Ocean (Menafrá et al. 2006). According to the Köppen-Geiger climate classification system, the study area belongs to the “Cfa” climate category, characterized by a humid subtropical climate with hot, humid summers and mild to cool winters (Kottek et al. 2006). In the zone of the study area, mean annual temperature is about 17°C with extreme recorded temperatures of -7°C in winter, and 39.2°C in summer in the 2000–2020 period. Mean annual precipitation is ca. 1,146 mm while annual wind velocity is 3,5 m/s coming predominantly from the east (Meteomanz 2020).

Punta Ballena is the coastal southern tip of the Sierra de la Ballena, a high deformation area approximately 4 km wide and exposed to at least 300 km in the south-east Uruguayan territory, which reaches 50 m in height at a distance of 200 m from the coastline (Spoturno et al. 2012). The Sierra de la Ballena, represents a shear zone (Gómez Rifas 1995) considered the tectonic limit between two different terrains, to the west – Terreno Nico Pérez and to the east – Cuchilla Dionisio (Bossi 2003; Goso and Muzio 2006). It extends from Punta Ballena on the coast, to the north-east of the country towards Cerro Largo department (Spoturno et al. 2012). This zone is characterized by a set of metamorphic rocks intensely deformed from materials of granite composition (Goso and Muzio 2006). Rock mineralogical composition is highly variable, composed by granite mylonites (feldspar), quartz mylonites (quartz with very fine muscovite, tourmaline and zircon accessories), phylonites and mylonitic porphyry (mainly feldspar and pyrite). Milonite quartz and mylonitic porphyry, due to their resistance to erosion, determine the important outcrop ridges which are highlighted in the study area (Spoturno et al. 2012).

An urbanized and a natural area coexist on the rocky point. The natural area is about 20 ha. (estimated from Google Earth and corrected with measured data of the slope of the area; Figs 1B, 2), in which numerous tourist-recreational activities are carried out, such as fishing, paragliding, rapelling (or abseiling), hiking, and visiting the caves. It is also highly valued as a place of great scenic beauty, and is used as a site for bird and whale watching, especially during the season when *Eubalaena australis*

whales visit the Uruguayan coasts. Punta Ballena has an access road (Carlos Paez Vilaró road, inaugurated in 1978), which separates the eastern-oriented slope from the western-oriented slope. The natural area of the rocky point is surrounded by several parking lots and an area where souvenir stalls are seasonally located. Additionally, *Casapueblo*, the well-known museum and hotel built by painter Carlos Paéz Vilaró, is located here, and is an architectural icon of the site. *Casapueblo* alone receives between 800–1500 visitors per day during the high season, and 200–400 people per day the rest of the year (data from Museo Casapueblo, personal comm. 2020). Therefore, Punta Ballena is a highly visited point, considering that it receives many more visitors than the museum itself.

The transformation of the locality of Punta Ballena started in 1896 when this area was bought by Antonio Lussich, an important merchant sailor. Lussich converted a great extension of dunes and hills into an artificial forest, and part of this area is currently an Arboretum (Álvarez 1910). In the last 70 years, Punta Ballena has undergone tourist-urbanistic development initially led by the architect Bonet (López Martínez et al. 2015). Currently, urbanistic development has accelerated with emphasis placed on development by the departmental government of the area (Roche and Gadino 2019) which resulted in a significant deterioration of the natural vegetation of the site (Bonifacino *s.d.*).

Data collection

The list of vascular plants was determined by the revision of herbarium exciccates and field surveys. The herbaria revised were MVFA, MVJB and MVM (herbaria acronyms follow Thiers 2022). In each herbaria, specimens collected in Punta Ballena were selected. Additionally, systematic surveys were carried out on the rocky point,

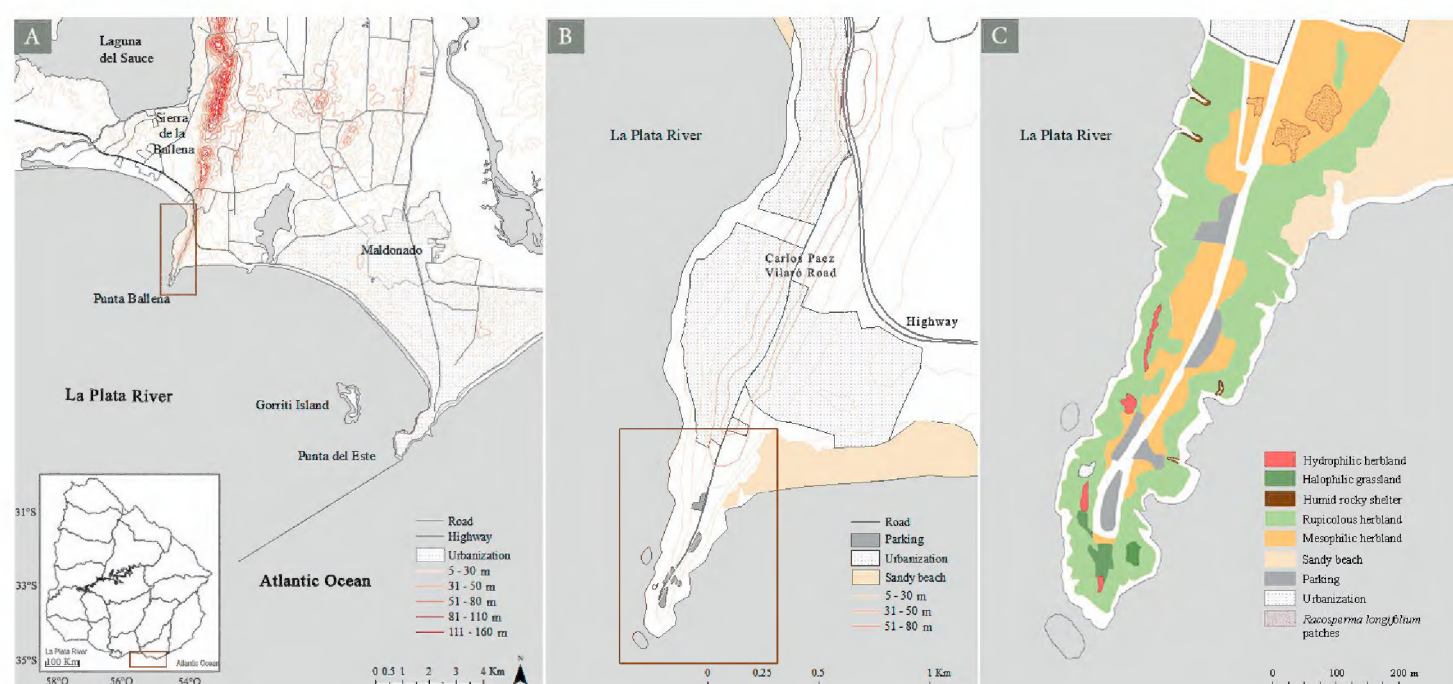


Figure 1. A: Geographic location of Punta Ballena, Maldonado Department, Uruguay B: Detail of Punta Ballena rocky point. C: Location of vegetation types in Punta Ballena.

throughout the remaining natural areas between buildings and more exhaustively in the natural area on the extreme point. Fieldwork was carried out every year from 2013 to 2021, regularly during spring, but in the last three years the site was visited in summer and autumn as well, in order to assess the species that flourish at that time. Taxa were identified by the use of regional and national keys, taxonomic literature and by the revision of herbarium specimens previously identified by specialists. Whenever needed, sterile live collections were cultivated until flowering for identification purposes. Species not documented in national herbaria were collected in order to be housed at MVJB. The systematic classification adopted follows APG IV (2016) for angiosperms, Christenhusz et al. (2011) for gymnosperms, and PPG I (2016) for ferns and lycophytes.

For each species the following information is included: *Species name*: species nomenclature follows the Flora del ConoSur database (IBODA 2022) and International Plant Index (IPNI 2022). In some cases, the name accepted by the IBODA (2022) was not followed, due to the existence of recent taxonomic studies, such as: for *Chascolytrum* (Da Silva et al. 2020), *Celtis* (Zamengo et al. 2020) and *Stenachaenium* (Gadea 2016). Some genera require a more in-depth review, such as *Mimosa* (Fabaceae) and *Porophyllum* (Asteraceae), therefore the oldest accepted names for these genera were used. Moreover, here we prefer to use the name *Oxalis macachin* Arechav. since the type is based on an exsiccate collected in the region, instead of the name *Oxalis brasiliensis* Lodd., G. Lodd. and W. Lodd. ex Hildebr. which is based on an illustration.

Type record

Each species was classified according to its presence in Punta Ballena as ‘current’ or ‘historic’. The first category are species observed or collected during fieldwork while ‘historic’ indicate species whose occurrence could not be confirmed in recent years, but there are herbarium specimens from the locality and the date of a reference collection is given. The historic species we consider ‘locally extinct’ are either those species whose main habitat was lost at the study site (therefore they cannot currently grow on the site), or species whose main habitat is still present but they were intensely searched without being found. Considering vegetal alterations and extraction of species in the site, we are certain that they have become locally extinct.

Vegetation type

Local sites with different physiognomy and species composition were identified and georeferenced throughout the rocky point. These sites were studied at different times of the year between 2019 and 2021, and the vegetation type was classified using an adaptation of Fagundez and Lezama (2005) proposal. The surface of each vegetation type was estimated from the georeferenced and mapped polygons over aerial pictures of the study site.



Figure 2. Aerial view and vegetation types of Punta Ballena. **A:** Aerial view of the natural area of Punta Ballena rocky point; **B-C:** rupicolous herblands and detail of the rocky substrate; **D:** mesophilic herblands associated with implanted *Racosperma longifolium* patches (in the background of the photo); **E:** hydrophilic herblands; **F:** halophilic grasslands; **G:** humid rocky shelters communities; **H:** native forest patches; **I:** Vegetation of disturbed areas on the access road (A-M. Bonifacino photo).

Life forms

We generated a life forms classification based on Punta Ballena's species (Table 1) since the most used global classifications (e.g. Raunkiaer 1934) generate overlapping categories when applied to species from the subtropical region (Ferreira et al. 2014). It integrates different plant features, such as: life cycle (annual or biennial vs. perennial); characteristic features of particular groups or families (e.g. Cactus, Ferns and Lycophytes); plant habit, architecture or physiognomy; woody development and presence of specialized subterraneous structures. The term 'therophyte' followed Raunkiaer (1934); life forms in Cactaceae were adapted from Vázquez-Sánchez et al. (2012); the term 'vein' was adapted from Moffett (2000), and 'shrubs and trees' from Haretche et al. (2012). For each species, life form was assigned according to the species development in the particular environmental conditions of Punta Ballena (in many cases it does not reflect the typical habit or size of the species).

Geographic origin

Geographic origin was assigned from the distribution data available in IBODA (2022), GBIF (2022) and specific data for some species (e.g. Zamengo et al. 2020). Based on the distribution of each species, they were classified as: 'Native' (species with wide distribution in Uruguay and nearby countries), 'Endemic' (species with a limited spatial distribution within Uruguay or neighboring regions), 'Cosmopolitan' (widely distributed in the world), 'Exotic' and 'Exotic – IAS' (Invasive and Alien Species, according to Masciadri et al. 2010). Moreover, endemic species were differentiated into 'local endemism' (species only present in Punta Ballena), 'national endemism' (species only present in Uruguay) and 'regional endemism' (species whose distribution is framed within the southern area of the Paranaense Province (Cabrera and Willink 1973) or the Paranaense Subregion (Morrone 2001). This area extends from Misiones province (Argentina) to the south, with a southern limit on the coast of Uruguay or Buenos Aires province (Argentina), and involves the following provinces or states: Santa Catarina and Rio Grande do Sul (Brazil); Ñeembucú, Itapuá and Misiones (Paraguay); Misiones, Corrientes, Entre Ríos, Buenos Aires (Argentina) and the total area of Uruguay.

Conservation status

Conservation status was defined according to the list of "priority species for conservation in Uruguay" by Marchesi et al. (2013) which is continuously updated by MVOTMA-MGAP-SNAP (2021), and IUCN category according to the Red List of Threatened Species (IUCN 2021) or with specific bibliography of some species or genera (Goettsch et al. 2015; Nuernberg Ronchi et al. 2016; González et al. 2018; Paz Deble et al. 2021).

Table 1. Classification of plant life form, from Punta Ballena species.

Lyfe cycle	Category	Sub-categories	Definition	Category name
Temporal plants			Annual or biennial plants.	Therophytes
Perennial plants	Ferns and Lycophytes		Plants with rhizome or globose stems.	Rhizomatous Ferns and Lycophytes
			Repent or reptant, without thickened stems.	Diffuse Ferns & Lycophytes
			Erect, without thickened stems.	Erect Ferns and Lycophytes
	Cactus		Shrubby or sub-shrubby, characterized by having cladodes.	Cladodius cactus
			Erect, the height is greater than the diameter, but does not exceed twice its diameter.	Columnar cactus
			Globose, the diameter of the stem is greater than its height and the vertical axis is compressed.	Globose-depressed cactus
			Globose, the stem is about the same height as the diameter.	Globose cactus
	Veins		Scandent, climber or creeper plant. Stems requiring external support to grow upward. Can be woody or not. Many grow decumbent on the ground. Some species that habitually grow as climbers are freestanding when young or develop as shrubs if no supports are available.	Veins
	Trees, shrubs, arborescent or suffrutex	Eudicots or gymnosperms (Woody or sub-woody)	Tree and tree-like plants, erect, with one or few well defined stems, partial or totally woody.	Trees
			Erect, branched at the base or close to it, with a minimum height of 50 cm, aerial woody stems persistent throughout the year.	Shrubs
			Bushes under 50 cm in height, base and basal stems woody or sub-woody, leaves and stems persistent throughout the year (at least part of it).	Suffrutex
		Monocots (not woody)	Shrub, tree or tree-like monocots.	Arborescent monocots
		Herbs	Grasses and Graminoids	Growing in tight groups, the bases of the individual plants touching. Includes plants with short rhizomes.
Repent, reptant or creeping plant; stems prostrate, decumbent, stoloniferous or with long rhizomes.				Diffuse grasses or graminoids
Herbs (excluding grass-like plants)	Seasonal herbs		Herbs that lose aerial organs and persist in the ground through bulbs, rhizomes or reservation roots (not ligneous).	Geophyte seasonal herbs
			Herbs that lose aerial organs and persist through xylopodium or ligneous bases, roots or short stems.	Xylopodial seasonal herb
	Evergreen herbs		Repent, reptant or creeping herbs; stems prostrate, decumbent, stoloniferous or with long rhizomes.	Diffuse evergreen herbs
			Ascendent or erect herbs.	Erect evergreen herbs
			Rosulate, evergreen herb with its leaves arranged in rosette.	Rosulate evergreen herbs

Results

A total of 427 species were registered on the Punta Ballena rocky point, distributed in 252 genera and 71 families (Table 2). Asteraceae and Poaceae were the richest families (82 spp.); the subsequent families with large contributions were Fabaceae (26 spp.), Cactaceae (14 spp.), Cyperaceae (14 spp.), Iridaceae and Solanaceae (12 spp., each one), Amaryllidaceae and Rubiaceae (11 spp., each one); the remaining families have fewer than 10 species, most of them having fewer than three species (Table 2).

Life forms and vegetation types

Herbs were dominant in the studied flora (76%), with a major representation of 'evergreen herbs', 'grasses and graminoids' and 'therophytes' (21, 20 and 19%), followed by 'seasonal herbs' (which persist through subterranean or basal resistant structures) which reached almost 16%. They were followed by suffrutex (9.6%), shrubs (4.2%) and cactus (3.5%). Less representation was shown by 'ferns and lycophytes', 'veins', 'trees' and 'arborescent monocots' (less than 2% each) (Fig. 3).

Five main native vegetation types were found in the natural area of Punta Ballena rocky point (Figs 1C, . 2): 'halophilic grasslands', 'humid rocky shelters communities', 'hydrophilic herblands', 'mesophilic herblands' and 'rupicolous herblands'. The latter vegetation type on the eastern slope is associated with implanted "*Racosperma longifolium* patches" (Table 2, Fig. 1C). Two additional vegetation types were found on the sides of the access road: 'native forest patches' and 'vegetation of disturbed areas'. 'Rupicolous herblands' developed over and between rocks, or in places near rocky outcrops with scarce soil availability (depth less than 10 cm); this is the most extensive vegetation type in the area covering nine ha. 'Mesophilic herblands' developed in areas higher than 20 m above sea level on long slopes of the rocky point, where soil is close to 50 cm deep; it occupied 5.3 ha, of which 0.4 ha corresponded to '*Racosperma longifolium* patches'. 'Halophilic grasslands' occur in sites exposed to temporary floods from de la Plata River on the extreme point, with scarce substrate mainly composed of sand, pieces of rock, and decomposing materials; this vegetation covered less than 0.3 ha. 'Hydrophilic herblands' developed in depressions between rocky areas or low areas of the slope, and were found only on the west slope of the rocky point. It had the deepest substrate, more than 80 cm deep, and occupied approximately 0.15 ha. 'Humid rocky shelters communities' developed on the rocks exposed to the tide and reached negligible surface coverage (< 0.1 ha).

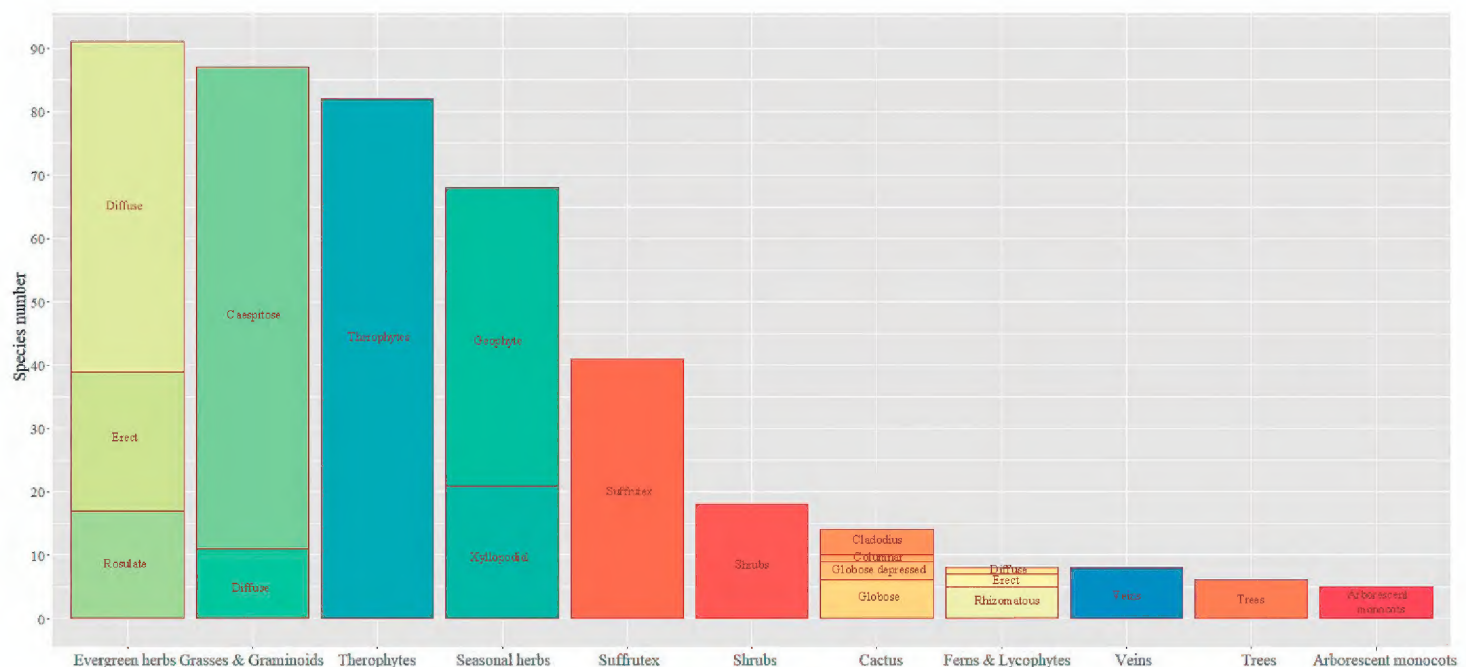


Figure 3. Species number of plant life forms found in Punta Ballena.

Table 2. Species list of Punta Ballena, Maldonado, Uruguay. Type record: Cu (Current, observed or collected in last three years), Hi (historic record, and year of collection). Reference voucher: one of the first and most complete specimens deposited in national herbaria (– in case of absence). Vegetation type: HG- halophilic grasslands, HH- hydrophilic herblands, HuC- humid rocky shelters communities; MH- mesophilic herblands, NF- native forest patches, RH- rupicolous herblands, VDA- vegetation of disturbed areas. Life form (definitions in Table 1): Ther- Therophytes; Ferns and Lycophytes (FL): DiFL- Diffuse, ErFL- Erect, RhFL- Rhizomatous; Cactus (Ca): CaCl- Cladodius, CaCo- Columnar, CaDe- Globose depressed, CaGl- Globose; Vein; Tree; Shru- Shrubs; Suff- Suffrutex; Arborescent Monocots- MoSh; Herbs: i) Grasses and Graminoids: GrCa- Caespitose, GrDi- Diffuse; ii) Seasonal herbs: SeGe- Geophyte; SeXy- Xylopodial; iii) Evergreen herbs: EvDi- Diffuse, EvEr- Erect, EvRo- Rosulate (‘ ’ suggested life form, that needs confirmation). Origin: Co – Cosmopolitan; Ex- Exotic; Ex- IAS – Exotic-Invasive and Alien Species; N- Native; En-Endemic, among endemic species: PB- Local endemism of Punta Ballena; Uy- National Endemism; RE- Regional Endemism. Status: Conservation status: Pr – Priority species for conservation in Uruguay, according to Marchesi et al. (2013); LC- Least Concern; VU – Vulnerable; EN – Endanger; according to IUCN (blank spaces in species not evaluated). An asterisk (*) indicates locally extinct species. Species number are shown in brackets after each family.

Group / Family / Species name	Type record	Reference voucher	Veg. type	Life form	Origin	Status
FERNS and LYCOPHYTES						
Lycopodiopsida						
Selaginellaceae Willk. (1)						
<i>Selaginella sellowii</i> Hieron.	Cu	Mai et al. 609 (MVJB 32665)	RH	DiFL	N	
Polypodiopsida						
Anemiaceae Link (1)						
<i>Anemia tomentosa</i> (Savigny) Sw.	Cu	Arrillaga et al. 2076 (MVFA)	RH	RhFL	N	
Blechnaceae Newman (1)						
<i>Blechnum laevigatum</i> Cav.	Cu	Mai & Zabaleta 595 (MVJB 32561)	HuC	ErFL	N	
Dryopteridaceae Herter (2)						
<i>Cyrtomium falcatum</i> (L. f.) C. Presl	Cu	Mai et al. 828 (MVJB 32736)	RH	RhFL	Ex	
<i>Rumohra adiantiformis</i> (G.Forst.) Ching	Cu	Berro 5245 (MVFA)	MH	RhFL	N	LC
Ophioglossaceae Martinov (1)						
<i>Ophioglossum crotalophoroides</i> Walter	Cu	Mai et al. 673 (MVJB 32651)	RH	RhFL	N	
Polypodiaceae J.Presl & C. (1)						
<i>Pleopeltis lepidopteris</i> (Langsd. & Fisch.) de la Sota	Cu	Berro 5240 (MVFA)	RH	RhFL	N	
Pteridaceae E.D.M.Kirchn. (2)						
<i>Adiantum raddianum</i> C. Presl	Cu	Mai et al. 728 (MVJB 32663)	HuC	ErFL	N	
<i>Gastoniella chaerophylla</i> (Desv.) Li Bing Zhang & Liang Zhang	Cu	Lombardo 21098 (MVJB)	HuC	Ther	N	
GIMNOSPERMS						
Ephedraceae Dumort. (1)						
<i>Ephedra tweediana</i> Fisch. & C.A. Mey. emend. J.H. Hunz.	Cu	Mai et al. 800 (MVJB 32634)	MH	Suff	N	LC
Pinaceae Spreng. ex F.Rudolphi (1)						
<i>Pinus pinaster</i> Aiton	Cu	–	MH	Tree	Ex-IAS	LC
ANGIOSPERMS						
Monocotyledoneae						
Amaryllidaceae J. St.-Hil. (11)						
<i>Beauverdia hirtella</i> (Kunth) Herter	Cu	Legrand 3926 (MVM 987)	RH	SeGe	En – Uy	
<i>Beauverdia sellowiana</i> (Kunth) Herter	Cu	Mai et al. 663 (MVJB 32543)	RH	SeGe	En – RE	
<i>Beauverdia vittata</i> (Griseb.) Herter	Cu	Legrand 3933 (MVM 1237)	RH	SeGe	En – RE	
<i>Ipheion recurvifolium</i> (C.H.Wright) Traub	Cu	–	RH, MH	SeGe	En –RE	
<i>Ipheion uniflorum</i> Raf.	Cu	Mai & Fernández 409 (MVJB 32757)	RH, MH	SeGe	En – RE	
<i>Nothoscordum bivalve</i> (L.) Britton var. <i>bivalve</i>	Cu	Mai 664 (MVJB 32545)	RH	SeGe	N	

Group / Family / Species name	Type record	Reference voucher	Veg. type	Life form	Origin	Status
<i>Nothoscordum montevidense</i> Beauverd subsp. <i>latitepalum</i> (Guagl.) Ravenna	Cu	Marchesi et al. <i>s.n.</i> (MVJB 32775)	RH	SeGe	N	
<i>Zephyranthes americana</i> (Hoffmanns.) Ravenna	Cu	Mai et al. 814 (MVJB 32548)	RH	SeGe	En – RE	
<i>Zephyranthes caerulea</i> (Griseb.) Traub	Hi (1907)	Berro 3703 (MVFA)	–	SeGe	N	
<i>Zephyranthes estensis</i> Ravenna	Cu	Del Puerto & Marchesi (MVFA 3402)	RH	SeGe	En – Uy	
<i>Zephyranthes tubispatha</i> (L'Hér.) Traub	Cu	Mai et al. 709 (MVJB 32547)	RH	SeGe	N	
Araceae Juss. (1)						
<i>Thaumatococcus undulatum</i> (Engl.) Sakur., Calazans & Mayo	Cu	–	MH	MoSh	N	
Arecaceae Bercht. & J.Presl (1)						
<i>Butia odorata</i> (Barb. Rodr.) Noblick	Cu	–	RH	Tree	En – RE	Pr
Asparagaceae Juss. (4)						
<i>Agave americana</i> L.	Cu	–	RH	MoSh	Ex	LC
<i>Asparagus asparagoides</i> Druce	Cu	Mai et al. 819 (MVJB 32558)	RH, MH	SeGe	Ex–IAS	
<i>Asparagus densiflorus</i> (Kunth) Jessop	Cu	Mai et al. 806 (MVJB 32557)	MH	EvDi	Ex–IAS	
<i>Yucca gloriosa</i> L.	Cu	–	RH	MoSh	Ex	
Bromeliaceae Juss. (1)						
<i>Dyckia remotiflora</i> A.Dietr.	Cu	Osten 4033 (MVM)	RH	EvRo	N	
Commelinaceae Mirb (1).						
<i>Commelina erecta</i> L.	Cu	Legrand 3852 (MVM)	MH	SeGe	N	LC
Cyperaceae Juss. (14)						
<i>Abildgaardia ovata</i> (Burm. f.) Kral	Cu	Lombardo 4444 (MVJB 11425)	HH	GrCa	N	
<i>Bulbostylis juncoideus</i> (Vahl) Kük. ex Herter var. <i>juncoideus</i>	Cu	Berro 3714 (MVFA)	HH	GrCa	N	
<i>Carex phalaroides</i> Kunth subsp. <i>phalaroides</i>	Cu	Arrillaga 459 (MVFA)	HH	GrCa	N	
<i>Carex vixdentata</i> (Kük.) G.A.Wheeler	Cu	Zabaleta et al. 284 (MVJB 32629)	HH	GrCa	N	Pr – LC
<i>Cyperus aggregatus</i> (Willd.) Endl.	Cu	Zabaleta et al. 295 (MVJB 32628)	HH	GrCa	N	
<i>Cyperus berroi</i> (C.B.Clarke) Barros	Hi 1948	Lombardo 4679 (MVJB)	HH	Ther	En – RE	Pr –
<i>Cyperus obtusatus</i> (J. Presl & C. Presl) Mattf. & Kük.	Cu	Zabaleta et al. 250 (MVJB 32618)	HH	GrDi	N	LC
<i>Cyperus polystachyos</i> Rottb.	Cu	Marchesi et al. <i>s.n.</i> (MVJB 32613)	HH	GrCa	N	LC
<i>Cyperus prolixus</i> Kunth	Cu	Osten 4025 (MVM)	HH	GrCa	N	
<i>Cyperus reflexus</i> Vahl	Cu	Zabaleta et al. 297 (MVJB 32615)	HH	GrCa	N	
<i>Cyperus rigens</i> J.Presl & C.Presl	Cu	Osten 4024 (MVM)	HH	GrCa	N	
<i>Eleocharis montevidensis</i> Kunth	Cu	Zabaleta et al. 281 (MVJB 32621)	HH	GrDi	N	Pr
<i>Fimbristylis dichotoma</i> (L.) Vahl var. <i>dichotoma</i>	Cu	Zabaleta & Mai 252 (MVJB 32631)	HH	Ther	Ex	LC
<i>Isolepis cernua</i> (Vahl) Roem. & Schult.	Cu	Zabaleta et al. 286 (MVJB 32619)	HH	Ther	N	LC
Hypoxidaceae R.Br. (1)						
<i>Hypoxis decumbens</i> L.	Cu	Legrand 3932 (MVM)	MH	GrCa	N	
Iridaceae Juss. (12)						
<i>Cypella herbertii</i> Herb.	Cu	Mai et al. 797 (MVJB 32642)	RH, MH	SeGe	N	
<i>Cypella osteniana</i> Beauverd	Cu	Mai et al. 920 (MVJB 33085)	RH	SeGe	En – Uy	Pr –
<i>Gelasine elongata</i> (Graham) Ravenna	Cu	Marchesi et al. (MVJB 33088)	RH	SeGe	N	EN
<i>Herbertia lahue</i> (Molina) Goldblatt subsp. <i>amoena</i> (Griseb.) Goldblatt	Cu	Mai & Pollero 923 (MVJB 33089)	RH, MH	SeGe	N	
<i>Herbertia pulchella</i> Sweet	Cu	Lombardo 2765 (MVJB)	RH, MH	SeGe	En – RE	
<i>Sisyrinchium avenaceum</i> Klatt	Cu	Arrillaga 465 (MVFA)	MH	GrCa	N	
<i>Sisyrinchium laxum</i> Otto ex Sims	Cu	Mai et al. 730 (MVJB 33086)	RH	Ther	N	

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<i>Sisyrinchium micranthum</i> Cav.	Hi 1956	Arrillaga 432 (MVFA)	–	Ther	N	
<i>Sisyrinchium minutiflorum</i> Klatt	Cu	Mai et al. 918 (MVJB 33065)	RH	Ther	N	
<i>Sisyrinchium palmifolium</i> L.	Cu	Mai et al. 863 (MVJB 32739)	MH	GrCa	N	
<i>Sisyrinchium rosenfurtii</i> I.M. Johnst.	Cu	Arechavaleta (MVM 18408)	MH	GrCa	En – RE	Pr
<i>Sisyrinchium scariosum</i> I.M. Johnst.	Cu	Lombardo (MVJB 2774)	RH	GrCa	N	
Juncaceae Juss. (4)						
<i>Juncus acutus</i> L.	Cu	Zabaleta et al. 302 (MVJB 32740)	RH	GrCa	N	LC
<i>Juncus capillaceus</i> Lam.	Cu	Zabaleta et al. 299 (MVJB 32741)	HH	GrCa	N	
<i>Juncus imbricatus</i> Laharpe	Cu	Zabaleta et al. 300 (MVJB 32742)	HH	GrCa	N	
<i>Juncus microcephalus</i> Kunth	Cu	Zabaleta et al. 301 (MVJB 32743)	HH	GrCa	N	
Orchidaceae Juss. (8)						
<i>Bipinnula gibertii</i> Rchb.f.	Cu	Osten 16875 (MVM)	RH	SeGe	En – RE	Pr
<i>Bipinnula montana</i> Arechav.	Cu	Osten 16876 (MVM)	RH	SeGe	En – RE	Pr
<i>Bipinnula penicillata</i> (Rchb. f.) Cisternas & Salazar	Cu	Mai et al. 695 (MVJB 32654)	RH	SeGe	N	
<i>Brachystele camporum</i> (Lindl.) Schltr.	Cu	Arrillaga et al. 2062 (MVFA)	RH	SeGe	N	
<i>Brachystele dilatata</i> (Lindl.) Schltr.	Cu	Marchesi & Izaguirre (MVFA 12239)	RH	SeGe	N	
<i>Habenaria montevidensis</i> Spreng.	Hi 1922	Osten 16844 (MVM)	–	SeGe	N	
<i>Skeptrostachys arechavaletanii</i> (Barb.Rodr.)	Cu	Rosengurt B-4446 (MVFA)	RH	SeGe	N	LC
<i>Skeptrostachys gigantea</i> (Cogn.) Garay	Cu	Arechavaleta 23 (MVFA)	RH	SeGe	N	
Poaceae Barnhart (82)						
<i>Agrostis montevidensis</i> Spreng. ex Nees	Cu	Arrillaga et al. 2075 (MVFA)	MH, RH	GrCa	N	
<i>Aira caryophyllea</i> L.	Cu	Lombardo 3520 (MVFA)	RH	Ther	Ex	
<i>Andropogon ternatus</i> (Spreng.) Nees	Cu	Mai et al. 719 (MVJB 32725)	RH	GrCa	N	
<i>Anthraenantia lanata</i> (Kunth) Benth.	Cu	–	RH	GrCa	N	
<i>Aristida filifolia</i> (Arechav.) Herter	Hi 1955	Rosengurt B-6410 (MVFA)	RH	GrCa	En – RE	
<i>Aristida murina</i> Cav.	Hi 1955	Rosengurt B-6405 (MVFA)	RH	GrCa	En – RE	
<i>Aristida pallens</i> Cav.	Hi 1973	Izaguirre & Laguardia s.n. (MVFA 12005)	–	GrCa	N	
<i>Aristida spegazzinii</i> Arechav.	Cu	Rosengurt B-6411 (MVFA)	RH	GrCa	N	
<i>Aristida teretifolia</i> Arechav.	Hi 1944	Rosengurt B-4671 (MVFA)	RH	GrCa	En – RE	
<i>Arundo donax</i> L.	Cu	–	MH	MoSh	Ex	LC
<i>Avena barbata</i> Pott ex Link	Cu	Marchesi & Mai s.n. (MVJB 33060)	MH	Ther	Ex	
<i>Bothriochloa laguroides</i> (DC.) Herter	Cu	Izaguirre & Laguardia (MVFA 12011)	MH, RH	GrCa	N	
<i>Briza maxima</i> L.	Cu	Mai et al. 909 (MVJB 33081)	MH, RH	Ther	Ex	
<i>Briza minor</i> L.	Cu	Mai et al. 919 (MVJB 33082)	MH, RH	Ther	Ex	
<i>Bromidium tandilense</i> (Kuntze) Rúgolo	Cu	Mai et al. 921_B (MVJB 33218)	RH	Ther	N	
<i>Bromus auleticus</i> Trin. ex Nees	Cu	Rosengurt B-6404 (MVFA)	MH	GrCa	N	
<i>Bromus catharticus</i> Vahl	Cu	Rosengurt B-6384 (MVFA)	MH	GrCa	N	
<i>Bromus hordeaceus</i> L.	Cu	–	MH	Ther	Ex	
<i>Cenchrus longisetus</i> M.C. Johnst.	Cu	Mai et al. 826 (MVJB 32702)	RH	GrDi	Ex	
<i>Chascolytrum brizoides</i> (Lam.) Essi, Longhi-Wagner & Souza-Chies	Cu	Mai et al. 720 (MVJB 32673)	MH	GrCa	N	
<i>Chascolytrum erectum</i> (Lam.) Desv	Cu	Rosengurt B-4527 (MVFA)	MH	GrCa	N	
<i>Chascolytrum rufum</i> J. Presl	Cu	Arechavaleta 404 (MVM)	MH	GrCa	N	
<i>Chascolytrum subaristatum</i> Desv.	Cu	Rosengurt B-6399 (MVFA)	MH	GrCa	N	
<i>Cinnagrostis alba</i> (J. Presl) P.M. Peterson, Soreng, Romasch. & Barberá var. <i>alba</i>	Cu	Rosengurt B-6396 (MVFA)	MH	GrCa	N	

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<i>Cinnagrostis viridiflavescens</i> (Poir.) P.M. Peterson, Soreng, Romasch. & Barberá var. <i>montevidensis</i>	Cu	Mai et al. 827 (MVJB 32709)	MH	GrCa	N	
<i>Cortaderia selloana</i> (Schult. & Schult. f.) Asch. & Graebn.	Cu	–	MH	GrCa	N	
<i>Cynodon dactylon</i> (L.) Pers.	Cu	Zabaleta et al. <i>s.n.</i> (MVJB 33080)	MH	GrDi	Ex–IAS	
<i>Danthonia cirrata</i> Hack. & Arechav.	Cu	Rosengurtt 6388 (MVFA)	MH	GrCa	N	
<i>Danthonia montevidensis</i> Hack. & Arechav.	Cu	Rosengurtt 6408 (MVFA)	MH	GrCa	N	
<i>Danthonia rhizomata</i> Swallen	Hi 1955	Rosengurtt B-6387 (MVFA)	–	GrCa	En – RE	Pr
<i>Dichanthelium sabulorum</i> (Lam.) Gould & C.A. Clark	Cu	Rosengurtt B-6403 (MVFA)	MH	GrCa	N	
<i>Digitaria enodis</i> (Hack.) Parodi	Hi 1944	Rosengurtt B-9648 (MVFA)	–	GrCa	En – RE	
<i>Echinochloa polystachya</i> (Kunth) Hitchc. var. <i>spectabilis</i>	Cu	Marchesi et al. <i>s.n.</i> (MVJB 32696)	HG	GrDi	N	Pr
<i>Eleusine tristachya</i> (Lam.) Lam.	Cu	Mai et al. 809 (MVJB 32684)	MH	Ther	N	LC
<i>Elionurus muticus</i> (Spreng.) Kuntze	Cu	Rosengurtt B-6391 (MVFA)	RH	GrCa	N	
<i>Eragrostis lugens</i> Nees	Cu	Izaguirre & Laguardia (MVFA 11996)	MH	GrCa	N	
<i>Eragrostis neesii</i> Trin.	Cu	Mai et al. 758 (MVJB 32715)	RH	GrCa	N	
<i>Eragrostis polytricha</i> Nees	Cu	Mai et al. 875 (MVJB 33219)	RH	GrCa	N	
<i>Eragrostis purpurascens</i> (Spreng.) Schult.	Hi 1955	Rosengurtt B-4523 (MVFA)	–	GrCa	N	
<i>Eragrostis trichocolea</i> Hack. & Arechav.	Hi 1908	Berro 5041 (MVFA)	–	GrCa	N	
<i>Eustachys paspaloides</i> (Vahl) Lanza & Mattei ssp. <i>caribaea</i> (Spreng.) Nowack	Cu	Rosengurtt B-4677 (MVFA)	RH	GrCa	N	
<i>Festuca bromoides</i> L.	Cu	Rosengurtt B-6402 (MVFA)	RH	Ther	Ex	
<i>Festuca</i> sp.	Cu	–	RH	Ther	–	
<i>Gymnopogon grandiflorus</i> Roseng., B.R. Arrill. & Izag.	Hi 1973	Izaguirre & Laguardia (MVFA 12008)	–	GrCa	N	
<i>Holcus lanatus</i> L.	Cu	Zabaleta et al. 359 (MVJB 33083)	HG	Ther	Ex	
<i>Jarava juncooides</i> (Speg.) Peñailillo	Hi 1955	Rosengurtt B-6397 (MVFA)	–	GrCa	N	Pr
<i>Jarava plumosa</i> (Spreng.) S.W.L. Jacobs & J. Everett	Cu	Mai et al. 840 (MVJB 32718)	MH	GrCa	N	
<i>Lolium multiflorum</i> Lam.	Cu	Mai et al. 908 (MVJB 33084)	MH	Ther	Ex	
<i>Louisiella elephantipes</i> (Nees ex Trin.) Zuloaga	Cu	Marchesi et al. <i>s.n.</i> (MVJB 33220)	HG	GrDi	N	
<i>Melica brasiliana</i> Ard.	Cu	Montoro <i>s.n.</i> (MVFA)	MH, RH	GrCa	N	
<i>Nassella filiculmis</i> (Delile) Barkworth	Cu	Rosengurtt B-6395 (MVFA)	MH	GrCa	N	
<i>Nassella melanosperma</i> (J. Presl) Barkworth	Cu	Rosengurtt B-6398 (MVFA)	MH	GrCa	N	
<i>Nassella pauciciliata</i> (Roseng. & Izag.) Barkworth	Cu	Marchesi (MVFA 7290)	MH	GrCa	En – Uy	Pr
<i>Panicum bergii</i> Arechav. var. <i>bergii</i>	Cu	Mai et al. 846 (MVJB 32700)	MH	GrCa	N	
<i>Panicum capillare</i> L.	Cu	Mai et al. 762	MH	Ther	Ex	
<i>Panicum gouninii</i> E. Fourn.	Cu	Mai et al. 847 (MVJB 32712)	MH	GrDi	N	
<i>Panicum racemosum</i> (P. Beauv.) Spreng.	Cu	Rosengurtt B 6382 (MVFA)	MH	GrDi	N	
<i>Parapholis incurva</i> (L.) C.E. Hubb.	Cu	Mai et al. 415 (MVJB 415)	RH	Ther	Ex	
<i>Paspalum urvillei</i> Steud.	Cu	Mai et al. 876 (MVJB 33222)	MH	GrCa	N	
<i>Paspalum plicatulum</i> Michx.	Cu	Rosengurtt B-4676-1/2 (MVFA)	RH	GrCa	N	LC
<i>Paspalum pumilum</i> Nees.	Cu	Marchesi et al. <i>s.n.</i> (MVJB 32682)	HH	GrCa	N	
<i>Paspalum vaginatum</i> Sw.	Cu	Mai et al. 848 (MVJB 32701)	RH, HG	GrDi	N	LC
<i>Piptochaetium confusum</i> Parodi	Hi 1955	Rosengurtt 6400 (MVFA)	–	GrCa	En – RE	
<i>Piptochaetium montevidense</i> (Spreng.) Parodi	Cu	Mai et al. 724 (MVJB 32690)	MH	GrCa	N	
<i>Poa lanigera</i> Nees	Cu	Rosengurtt B-6394 (MVFA)	RH	GrCa	N	LC
<i>Poa ligularis</i> Nees ex Steud. var. <i>resinulosa</i> (Nees ex Steud.) Fernández Pepi & Giussani	Cu	Rosengurtt B-6394 b (MVFA)	RH	GrCa	N	
<i>Polypogon elongatus</i> Kunth var. <i>elongatus</i>	Cu	Mai et al. 917 (MVJB 33216)	RH	GrCa	N	
<i>Polypogon imberbis</i> (Phil.) Johow	Cu	Rosengurtt B-6403 (MVFA)	HG	GrCa	N	

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<i>Polypogon maritimus</i> Willd.	Cu	Mai et al. 921 (MVJB 33223)	RH	Ther	Ex	
<i>Rostraria cristata</i> (L.) Tzvelev	Cu	–	MH, RH	Ther	Ex	
<i>Schizachyrium microstachyum</i> (Desv. ex Ham.) Roseng., B.R. Arrill. & Izag.	Hi 1903	Arechavaleta (MVM 4251)	–	GrCa	N	
<i>Schizachyrium salzmanii</i> var. <i>aristatum</i> (Hack.) Peichoto	Cu	Rosengurtt B-6402 (MVFA)	RH	GrCa	N	
<i>Schizachyrium spicatum</i> (Spreng.) Herter	Cu	Izaguirre y Laguardia (MVFA 11997)	RH	GrCa	N	
<i>Setaria parviflora</i> (Poir.) Kerguélen var. <i>parviflora</i>	Cu	Mai et al. 860 (MVJB 32711)	MH	GrCa	N	LC
<i>Setaria vaginata</i> Spreng.	Cu	Del Puerto 3072 (MVFA)	RH	GrCa	N	
<i>Sorghastrum pellitum</i> (Hack.) Parodi	Cu	Rosengurtt B-6389 (MVFA)	MH, RH	GrCa	N	
<i>Sporobolus coarctatus</i> (Trin.) P.M. Peterson & Saarela	Cu	Rosengurtt B-4445 (MVFA)	HG	GrCa	N	
<i>Sporobolus densiflorus</i> (Brongn.) P.M. Peterson & Saarela	Cu	Rosengurtt B-4436 (MVFA)	HG	GrDi	N	
<i>Sporobolus indicus</i> R.Br.	Cu	Arrillaga 442 (MVFA)	HG	GrCa	N	LC
<i>Stenotaphrum secundatum</i> (Walter) Kuntze	Cu	Mai & Rodríguez-Tricot 934 (MVJB 33211)	MH, HH	GrDi	N	LC
<i>Trachypogon spicatus</i> Kuntze	Cu	Mai et al. 868 (MVJB 32693)	RH, MH	GrCa	N	
Thyphaceae Juss. (1)						
<i>Typha domingensis</i> Pers.	Cu	–	HH	SeGe	N	LC
Xanthorrhoeaceae Dumort. (1)						
<i>Aloe arborescens</i> Mill.	Cu	–	MH	MoSh	Ex	LC
Eudicotyledoneae						
Acanthaceae Juss. (2)						
<i>Dicliptera squarrosa</i> Nees	Cu	Berro 3748 (MVFA)	MH	EvDi	N	
<i>Stenandrium dulce</i> (Cav.) Nees	Cu	Mai 608 (MVJB 32540)	RH	EvRo	N	
Aizoaceae Martinov (2)						
<i>Carpobrotus edulis</i> N.E.Br.	Cu	–	RH, MH	EvDi	Ex–IAS	
<i>Tetragonia tetragonoides</i> (Pall.) Kuntze	Cu	Arechavaleta (MVM 5143)	HG	Ther	Ex	
Amaranthaceae Juss. (6)						
<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	Cu	Fernández et al. <i>s.n.</i> (MVJB 32542)	HH	SeGe	N	
<i>Atriplex prostrata</i> Boucher ex DC.	Cu	Mai <i>et al.</i> 807 (MVJB 32735)	HG	Ther	N	
<i>Gomphrena perennis</i> L.	Cu	Marchesi 653 (MVFA)	MH	SeXy	N	
<i>Pfaffia gnaphaloides</i> Mart.	Cu	Marchesi 643 (MVFA)	RH	SeXy	N	
<i>Pfaffia tuberosa</i> (Moq. ex DC.) Hicken	Cu	Marchesi 7302 (MVFA)	MH	SeXy	N	
<i>Salicornia ambigua</i> Michx.	Cu	Mai et al. 857 (MVJB 32541)	RH	Suff	N	
Anacardiaceae R. Br. (2)						
<i>Schinus engleri</i> F.A. Barkley var. <i>uruguayensis</i> F.A. Barkley	Cu	Lombardo 10965 (MVFA)	MH	Shru	N	
<i>Schinus weinmannifolius</i> Engl.	Cu	Rosengurtt B-4688 (MVFA)	MH	Suff	N	
Apiaceae Lindl. (9)						
<i>Apium prostratum</i> Labill.	Cu	Del Puerto 3869 (MVFA)	RH	Ther	N	Pr
<i>Bowlesia incana</i> Ruiz & Pav.	Cu	Mai et al. 665 (MVJB 32553)	RH	Ther	N	
<i>Eryngium</i> aff. <i>paniculatum</i> Cav. & Delaroche	Cu	Arrillaga 2071 (MVFA)	MH	EvRo	En – RE	
<i>Eryngium elegans</i> Cham. & Schltdl.	Cu	Mai et al. 832 (MVJB 32551)	MH	EvRo	N	
<i>Eryngium horridum</i> Malme	Cu	Arrillaga et al. 2064 (MVFA)	MH	EvRo	N	
<i>Eryngium nudicaule</i> Lam.	Cu	Mai et al. 687 (MVJB 32554)	MH	EvRo	N	
<i>Eryngium sanguisorba</i> Cham. & Schltdl.	Cu	Del Puerto & Marchesi (MVFA 3404)	RH, MH	EvEr	N	
<i>Hydrocotyle bonariensis</i> Lam.	Cu	Mai et al. 837 (MVJB 32552)	RH	EvDi	N	LC
<i>Lilaeopsis brasiliensis</i> (Glaz.) Affolter	Cu	Mai et al. 777 (MVJB 32555)	HH	‘SeGe’	N	
Asclepiadaceae Borkh (7).						
<i>Asclepias mellodora</i> A.St.-Hil.	Hi 1963	Marchesi 710 (MVFA)	–	SeXy	N	

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<i>Mandevilla petraea</i> (A. St.-Hil.) Pichon	Hi 1907	Berro 3662 (MVFA)	–	SeXy	N	
<i>Oxypetalum arnottianum</i> H. Buek	Hi 1967	Marchesi (MVFA 7293)	–	SeXy	N	
<i>Oxypetalum marchesii</i> C. Ezcurra & A. González	Cu	Lombardo et al. 10952 (MVFA)	RH, MH	EvDi	En – Uy	VU
* <i>Oxypetalum nigricans</i> (Decne.) Liede & Meve	Hi [1903]	Arechavaleta 2529 (MVM)	–	SeXy	En – Uy	
<i>Oxypetalum pannosum</i> Decne.	Hi 1963	Marchesi 667 (MVFA)	–	EvDi	N	
<i>Oxypetalum tomentosum</i> Wight ex Hook. & Arn.	Cu	Marchesi (MVFA 7292)	RH, MH	EvDi	N	
Asteraceae Bercht. & J. Presl (82)						
<i>Acanthospermum australe</i> (Loefl.) Kuntze	Cu	Mai et al. 815 (MVJB 32576)	RH, MH	Ther	N	
<i>Acanthostyles buniifolius</i> (Hook. & Arn.) R.M. King & H. Rob.	Cu	Arechavaleta <i>s.n.</i> (MVM)	MH	Shru	N	
<i>Achyrocline flaccida</i> DC.	Cu	Mai et al. 816 (MVJB 32575)	RH	EvEr	N	
<i>Achyrocline satureioides</i> (Lam.) DC.	Cu	Del Puerto & Marchesi (MVFA 3424)	MH	EvEr	N	
<i>Acmella decumbens</i> (Sm.) R.K.Jansen	Cu	Marchesi 638 (MVFA)	RH, MH	EvDi	N	
<i>Aldama nudicaulis</i> (Baker) E.E.Schill. & Panero	Cu	Izaguirre & Marchesi (MVFA 12237)	RH, MH	EvDi	En – RE	Pr
<i>Aspilia montevidensis</i> (Spreng.) Kuntze	Cu	Osten 17071 (MVM)	RH, MH	EvDi	N	
<i>Baccharis aliena</i> (Spreng.) Joch.Müll.	Hi 1956	Arrillaga 454 (MVFA)	–	Shru	N	
<i>Baccharis arenaria</i> Baker	Hi 1956	Arrillaga 430 (MVFA)	–	Suff	En – RE	
<i>Baccharis articulata</i> Pers.	Cu	Osten 3888 (MVM)	RH	Suff	N	
<i>Baccharis cultrata</i> Baker	Cu	Arechavaleta 3104 (MVM)	VDA	Suff	N	
<i>Baccharis dracunculifolia</i> DC.	Cu	Mai et al. 820 (MVJB 32569)	MH	Shru	N	
<i>Baccharis gnaphalioides</i> Spreng.	Hi 1942	Lombardo 6202 (MVJB)	–	EvDi	En – RE	
<i>Baccharis microdonta</i> DC.	Cu	Rosengurt B-4347 (MVM 11067, MVFA)	MH	Shru	N	
<i>Baccharis ochracea</i> Spreng.	Hi 1907	Berro 3584 (MVFA)	–	Suff	N	
<i>Baccharis patens</i> Baker	Cu	Del Puerto & Codina (MVFA 9309)	RH	Suff	En – RE	
<i>Baccharis sessiliflora</i> Vahl	Cu	Arechavaleta <i>s.n.</i> (MVM 20900)	RH	Suff	N	
<i>Baccharis spicata</i> (Lam.) Baill.	Cu	Mai et al. 822 (MVJB 32577)	RH, MH	Shru	N	
<i>Baccharis trimera</i> (Less.) DC.	Cu	Mai et al. 823 (MVJB 32573)	MH	Suff	N	
<i>Baccharis vulneraria</i> Baker	Hi 1942	Lombardo <i>s.n.</i> (MVJB 7491)	–	Suff	N	
<i>Bidens pilosa</i> L.	Cu	Fernandez et al. <i>s.n.</i> (MVJB 32756)	VDA	Ther	N	
<i>Calea uniflora</i> Less.	Cu	Del Puerto 3865 (MVFA)	MH	SeXy	N	
<i>Carduus pycnocephalus</i> L.	Cu	Mai et al. 824 (MVJB 32571)	MH	Ther	Ex	
<i>Chaptalia exscapa</i> (Pers.) Baker	Cu	Lombardo 6252 (MVJB)	RH	EvRo	N	
<i>Chaptalia integerrima</i> (Vell.) Burkart	Cu	Rosengurt B-4686 (MVFA)	MH	EvRo	N	
<i>Chaptalia sinuata</i> (Less.) Baker	Cu	Mai 603 (MVJB 32601)	RH	EvRo	N	
<i>Chevreulia sarmentosa</i> (Pers.) S.F. Blake	Cu	Fernández et al. <i>s.n.</i> (MVJB 32606)	MH	EvDi	N	
<i>Chromolaena caaguazuensis</i> (Hieron.) R.M. King & H. Rob.	Hi 1948	Lombardo 6093 <i>p.p.</i> (MVJB 10362)	MH	SeXy	N	
<i>Chromolaena hirsuta</i> (Hook. & Arn.) R.M.King & H.Rob.	Cu	Berro 5036 (MVFA)	MH	SeXy	N	
<i>Chromolaena squarrosa</i> (Hook. & Arn.) R.M.King & H.Robinson	Cu	Berro 5035 (MVFA)	MH	SeXy	N	
<i>Chrysolaena flexuosa</i> (Sims) H. Rob.	Cu	Marchesi <i>s.n.</i> (MVFA 7391)	MH	SeXy	N	
<i>Coleostephus myconis</i> (L.) Cass.	Cu	Arrillaga 457 (MVFA)	VDA	Ther	Ex–IAS	

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<i>Conyza blakei</i> (Cabrera) Cabrera	Cu	Berro 5042 (MVFA)	VDA	EvEr	N	
<i>Conyza primulifolia</i> (Lam.) Cuatrec. & Lourteig	Hi 1907	Berro 3595 (MVFA)	–	EvEr	N	
<i>Conyza sumatrensis</i> (Retz.) E. Walker var. <i>sumatrensis</i>	Cu	Mai et al. 873 (MVJB 32587)	VDA	Ther	N	
<i>Criscia stricta</i> (Spreng.) L.Katinas	Cu	Marchesi 630 (MVFA)	MH	EvRo	En – RE	
<i>Delairea odorata</i> Lem.	Cu	Mai & Rodríguez-Tricot (MVJB 33212)	VDA	Vein	Ex	
<i>Eclipta elliptica</i> DC.	Cu	Mai et al. 711 (MVJB 32593)	RH	EvDi	N	
<i>Eclipta prostrata</i> (L.) L.	Cu	Marchesi et al. <i>s.n.</i> (MVJB 32589)	HH	Ther	N	LC
<i>Facelis retusa</i> Sch.Bip.	Cu	Arrillaga 421 (MVFA)	MH, RH	Ther	N	
<i>Gamochaeta americana</i> (Mill.) Wedd.	Cu	Lombardo 2103 (MVJB)	RH	EvEr	N	
<i>Gamochaeta argentina</i> Cabrera	Cu	Arrillaga 423 (MVFA)	RH	Ther	N	
<i>Gamochaeta filaginea</i> (DC.) Cabrera	Cu	Fernández et al. <i>s.n.</i> (MVJB 32586)	RH, MH	Ther	N	
<i>Grazielia brevipetiolata</i> R.M.King & H.Rob.	Cu	Osten 3887 (MVM)	RH	Suff	En – Uy	Pr
* <i>Gyptis commersonii</i> Cass.	Hi 1899	Berro 5037 (MVFA)	–	SeXy	N	
* <i>Gyptis tanacetifolia</i> (Gillies ex Hook. & Arn.) D.J.N. Hind & Flann	Hi 1969	Marchesi 7299 (MVFA)	–	SeXy	N	
<i>Hatschbachiella tweediana</i> (Hook. & Arn.) R.M. King & H. Rob.	Cu	Lombardo 7488 (MVJB)	RH	Suff	N	
<i>Helminthotheca echioides</i> (L.) Holub	Cu	Mai et al. 835 (MVJB 32598)	RH, MH	Ther	Ex	
<i>Hieracium commersonii</i> Monnier	Cu	Legrand 3927 (MVM)	MH	‘EvEr’	N	
<i>Hieracium palezieuxii</i> Zahn	Cu	Mai et al. 836 (MVJB 32579)	MH	‘EvEr’	N	
<i>Holocheilus brasiliensis</i> (L.) Cabrera	Cu	Del Puerto & Marchesi (MVFA 5224)	MH	‘EvEr’	N	
<i>Hypochaeris megapotamica</i> Cabrera	Cu	Fernandez et al. <i>s.n.</i> (MVJB 32603)	MH, RH	‘SeGe’	N	
<i>Hypochaeris radicata</i> L.	Cu	Mai et al. 713 (MVJB 32583)	MH	EvRo	Ex	
<i>Hypochaeris rosengurtii</i> Cabrera	Cu	Marchesi 657 (MVFA)	MH	EvRo	En – RE	
<i>Lessingianthus plantaginodes</i> (Less.) H. Rob.	Cu	Rosengurt B-4438 (MVFA)	MH	Suff	N	
<i>Lucilia acutifolia</i> Cass.	Cu	Arechavaleta <i>s.n.</i> (MVM)	MH	EvEr	N	
<i>Lucilia nitens</i> Less.	Cu	Mai et al. 842 (MVJB 32580)	MH	EvDi	N	
<i>Micropsis spathulata</i> (Pers.) Cabrera	Cu	Mai et al. 714 (MVJB 32591)	RH, MH	Ther	N	
<i>Neja filiformis</i> (Spreng.) Nees	Cu	Arrillaga et al. 2073 (MVFA)	RH	Suff	N	
<i>Noticastrum gnaphalioides</i> (Baker) Cuatrec.	Cu	Izaguirre & Laguardia (MVFA 11995)	RH, MH	EvDi	N	
<i>Panphalea commersonii</i> Cass.	Cu	Mai et al. 715 (MVJB 32599)	MH	SeGe	N	
<i>Panphalea heterophylla</i> Less.	Hi 1937	Lombardo 3148 (MVJB 11024)	–	Ther	En – RE	
<i>Podocoma hieracifolia</i> (Poir.) Cass.	Cu	Del Puerto & Marchesi (MVFA 3436)	MH	‘EvRo’	N	
<i>Porophyllum brevifolium</i> (Hook. & Arn.) Malme	Cu	Berro 3592 (MVFA)	RH	Suff	En – Uy	Pr
<i>Pseudognaphalium cheiranthifolium</i> (Lam.) Hilliard & B.L.Burt	Cu	Mai et al. 853 (MVJB 32574)	RH	EvEr	N	
<i>Pseudognaphalium gaudichaudianum</i> (DC.) Anderb.	Cu	Mai et al. 813 (MVJB 32584)	MH	Ther	N	
<i>Pseudognaphalium leucocephalum</i> (Cabrera) Anderb.	Hi 1944	Rosengurt B-5726 (MVFA)	–	EvEr	N	
<i>Pterocaulon alopecuroides</i> (Lam.) DC.	Cu	Mai et al. 854 (MVJB 32581)	RH	‘EvEr’	N	
<i>Pterocaulon balansae</i> Chodat	Cu	Lombardo 5511 (MVJB)	VDA	‘EvEr’	N	
<i>Schlechtendalia luzulaefolia</i> Less.	Cu	Berro 3595 (MVFA)	MH	GrCa	N	Pr
<i>Senecio brasiliensis</i> (Spreng.) Less. var. <i>incanus</i> Baker	Hi 1947	Cabrera (MVM 13534)	–	Suff	N	
<i>Senecio heterotrichus</i> DC.	Hi 1937	Lombardo 2041 (MVJB)	–	Ther	N	
<i>Senecio ostenii</i> Mattf. var. <i>balaenicus</i> Cabrera	Cu	Lombardo et al. 10953 (MVFA)	RH	EvEr	En– PB	Pr
<i>Senecio selloi</i> DC.	Cu	Mai et al. 915 (MVJB 33064)	MH	Ther	En – RE	
<i>Senecio viravira</i> Hieron.	Hi 1907	Berro 846 (MVFA)	–	Suff	N	
<i>Sommerfeltia spinulosa</i> Less.	Cu	Berro 5054 (MVFA)	RH	Suff	N	Pr
<i>Sonchus oleraceus</i> L.	Cu	Mai et al. 865 (MVJB 32578)	MH	Ther	Ex	

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<i>Stenachaenium megapotamicum</i> (Spreng.) Baker	Cu	Osten 16846 (MVM)	RH, MH	EvDi	N	
<i>Stevia congesta</i> Hook. & Arn.	Cu	Lombardo 6250 (MVJB)	MH	SeGe	En – Uy	Pr
<i>Stevia multiaristata</i> Spreng.	Cu	Mai et al. 867 (MVJB 32609)	MH	SeGe	N	
<i>Trichocline incana</i> Cass.	Cu	Marchesi 618 (MVFA)	RH	EvRo	N	Pr
<i>Urospermum picroides</i> (L.) F.W.Schmidt	Cu	Mai et al. 907 (MVJB 33091)	RH	Ther	Ex	
Boraginaceae Juss. (1)						
<i>Echium plantagineum</i> L.	Cu	Reus 10962 (MVFA)	MH	Ther	Ex	
Brassicaceae Burnett (2)						
<i>Cakile maritima</i> Scop.	Cu	Lombardo 2375 (MVJB 12318)	HG	Ther	Co	
<i>Lepidium bonariense</i> L.	Cu	Berro 3622 (MVFA)	RH	Ther	N	
Cactaceae Juss. (14)						
<i>Cereus uruguayanus</i> R. Kiesling	Cu	Osten 6506 (MVM)	NF	CaCo	En – RE	LC
<i>Frailea pygmaea</i> (Speg.) Britton & Rose	Cu	Mai 930 (MVJB 33070)	RH	CaDe	En – RE	LC
<i>Gymnocalycium hyptiacanthum</i> (Lem.) Britton & Rose	Cu	Mai et al. 689 (MVJB 32726)	RH	CaDe	En – RE	LC
<i>Opuntia arechavaletae</i> Speg.	Cu	Osten 16871 (MVM)	RH	CaCl	N	LC
<i>Opuntia aurantiaca</i> Lindl.	Cu	Nyffeler and Eggli 1446 (MVJB 22375)	RH	CaCl	En – RE	LC
<i>Opuntia elata</i> Salm-Dyck	Cu	–	NF	CaCl	N	LC
<i>Opuntia megapotamica</i> Arechav.	Cu	–	NF	CaCl	N	LC
<i>Parodia concinna</i> (Monv.) N.P.Taylor	Cu	Osten 16838 (MVM)	RH	CaDe	En – RE	VU
<i>Parodia erinacea</i> (Haw.) N.P. Taylor	Cu	Osten 16840 (MVM)	RH	CaGl	N	LC
* <i>Parodia mammulosa</i> (Lem.) N.P.Taylor	Hi 1964	Marchesi CH 152 (MVFA)	RH	CaGl	En – RE	LC
<i>Parodia ottonis</i> (Lehm.) N.P.Taylor	Cu	Osten 16839 (MVM)	RH	CaGl	N	VU
<i>Parodia scopa</i> (Spreng.) N.P.Taylor	Cu	Legrand 3153 (MVM)	RH	CaGl	En – RE	VU
<i>Parodia sellowii</i> (Link & Otto) D.R. Hunt	Cu	Mai & Pollero 925 (MVJB 33071)	RH	CaGl	En – RE	VU
<i>Parodia tabularis</i> (Cels ex Rümpler) D.R.Hunt	Cu	Marchesi CH 149 (MVFA)	RH	CaGl	En – PB	Pr
Campanulaceae Juss (2).						
<i>Triodanis perfoliata</i> (L.) Nieuwl. var. <i>biflora</i>	Hi 1963	Marchesi 633 (MVFA)	–	Ther	N	
<i>Wahlenbergia linarioides</i> (Lam.) A. DC.	Cu	Mai et al. 690 (MVJB 32563)	RH, MH	SeXy	N	
Cannabaceae Martinov (1)						
<i>Celtis spinosa</i> Spreng.	Cu	Mai et al. 825 (MVJB 32564)	NF	Shru	N	LC
Caryophyllaceae Juss. (9)						
<i>Cerastium commersonianum</i> Ser. ex DC.	Hi 1899	Osten 3876 (MVM)	RH	Ther	N	
<i>Cerastium glomeratum</i> Thuill.	Hi 1922	Osten 17070 (MVM)	RH	Ther	Ex	
<i>Paronychia setigera</i> (Gillies) F. Herm.	Cu	Fernández et al. <i>s.n.</i> (MVJB 32732)	RH	EvDi	N	
<i>Polycarpon tetraphyllum</i> (L.) L.	Cu	Mai et al. 718 (MVJB 32733)	RH, MH	Ther	Ex	
<i>Sagina apetala</i> Ard.	Cu	Brussa & Brussa (MVJB 31899)	RH	Ther	Ex	
<i>Silene gallica</i> L.	Cu	Masciadri <i>s.n.</i> (MVJB 27203)	RH	Ther	Ex–IAS	
<i>Spergula grandis</i> Pers.	Cu	Rosengurt B 6407 (MVFA)	RH	SeGe	N	
<i>Spergula salina</i> (J.Presl & C.Presl) D.Dietr.	Cu	Mai et al. 668 (MVJB 32734)	RH, HG	Ther	Co	
<i>Spergularia rupestris</i> Cambess.	Cu	Rosengurt B 4448 (MVFA)	RH	Suff	En – Uy	Pr
Cistaceae Juss. (1)						
<i>Crocanthemum brasiliense</i> (Lam.) Spach	Cu	Mai et al. 796 (MVJB 32565)	MH	EvEr	N	
Convolvulaceae Juss (7).						
<i>Convolvulus hermanniae</i> L'Hér.	Cu	Del Puerto & Marchesi (MVFA 3403)	MH	Vein	N	
<i>Convolvulus sepium</i> L. ssp. <i>americana</i> (Sims) Brummitt	Cu	–	HH	Vein	Ex	
<i>Dichondra sericea</i> Sw.	Cu	Zabaleta et al. 356 (MVJB 33092)	RH, MH	EvDi	N	
<i>Evolvulus sericeus</i> Sw.	Cu	Mai et al. 801 (MVJB 32566)	MH	EvDi	N	
<i>Ipomoea cairica</i> (L.) Sweet	Cu	Mai et al. 838 (MVJB 32730)	MH	Vein	N	LC

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<i>Ipomoea indica</i> (Burm.) Merr.	Cu	Mai et al. 839 (MVJB 32731)	MH	Vein	N	
<i>Ipomoea platensis</i> Ker-Gawl.	Cu	Mai & Pollero 926 (MVJB 33093)	HG	Vein	N	
Crassulaceae J. St.-Hil. (2)						
<i>Crassula caudiculata</i> Bacigalupo & Rossow	Cu	Mai et al. 669 (MVJB 32568)	RH	Ther	En – RE	Pr
<i>Crassula drummondii</i> (Torr. & A.Gray) Fedde	Cu	Mai et al. 471 (MVJB 32567)	RH	Ther	N	
Euphorbiaceae Juss. (6)						
<i>Croton chamaepitys</i> Baill.	Hi 1944	Rosengurt B 4691 (MVFA)	–	Suff	En – Uy	Pr
<i>Croton lanatus</i> Lam.	Cu	Lombardo 2537 (MVJB 9333)	RH	Suff	N	
<i>Croton nitrariifolius</i> Baill.	Cu	Arechavaleta <i>s.n.</i> (MVM 5177)	RH	Suff	En – RE	Pr
<i>Euphorbia caespitosa</i> Lam.	Hi 1956	Arrillaga 446 (MVFA)	–	Suff	N	
<i>Euphorbia klotzschii</i> Oudejans	Cu	Mai et al. 833 (MVJB 32737)	RH	Ther	N	
<i>Manihot grahamii</i> Hook.	Cu	Mai et al. 843 (MVJB 32738)	NF	Tree	N	
Fabaceae Lindl. (26)						
<i>Adesmia punctata</i> (Poir.) DC. var. <i>punctata</i>	Cu	Lombardo 2599 (MVJB 12748)	MH	EvDi	N	
<i>Centrosema virginianum</i> (L.) Benth.	Hi 1907	Arechavaleta (MVM 5592)	–	Vein	N	
<i>Desmanthus virgatus</i> (L.) Willd.	Cu	Marchesi 623 (MVFA)	MH	EvEr	N	LC
<i>Galactia marginalis</i> Benth.	Cu	Zabaleta et al. 294 (MVJB 32639)	RH	EvDi	N	
<i>Genista monspessulana</i> (L.) L.A.S. Johnson	Cu	Praderi <i>s.n.</i> (MVM)	MH	Shru	Ex	
<i>Lathyrus crassipes</i> Gillies ex Hook. & Arn.	Cu	Marchesi et al. (MVJB 33061)	RH	Ther	N	
<i>Lathyrus nervosus</i> Lam.	Cu	Osten 3972 (MVM)	MH	EvDi	N	
<i>Lathyrus subulatus</i> Lam.	Cu	Arechavaleta <i>s.n.</i> (MVM)	MH	SeXy	N	
<i>Lupinus bracteolaris</i> Desr. var. <i>bracteolaris</i>	Cu	Mai & Pollero 928 (MVJB 33094)	RH	Ther	En – RE	
<i>Lupinus gibertianus</i> C.PSm.	Cu	Osten 16848 (MVM)	MH	Ther	N	
<i>Lupinus multiflorus</i> Desr.	Cu	Osten 3988 (MVM)	MH	EvEr	N	
<i>Macroptilium prostratum</i> (Benth.) Urb.	Hi 1922	Osten 16864 (MVM)	–	EvDi	N	
<i>Medicago minima</i> (L.) Bartal. var. <i>minima</i>	Cu	Marchesi et al. (MVJB 33096)	MH	Ther	Ex	
<i>Medicago truncatula</i> Gaertn.	Hi 1965	Del Puerto & Marchesi (MVFA 5227)	MH	Ther	Ex	LC
<i>Mimosa amphigena</i> Burkart var. <i>trachycarpoides</i> Burkart	Cu	Lombardo (MVJB 12676)	RH	Suff	En – Uy	Pr
<i>Mimosa ramulosa</i> Benth.	Cu	Lombardo (MVJB 12706)	RH	Shru	En – RE	
<i>Mimosa reptans</i> Benth.	Cu	Osten 17100 (MVM)	RH	Suff	En – RE	Pr
<i>Psoralea pinnata</i> L. var. <i>speciosa</i> Harv.	Cu	–	VDA	Shru	Ex	
<i>Racosperma longifolium</i> (Andrews) Pedley	Cu	–	MH	Shru	Ex–IAS	
<i>Rhynchosia bicentrica</i> B.L. Turner	Cu	Arechavaleta (MVM 5564)	MH	EvDi	N	
<i>Rhynchosia corylifolia</i> Mart. ex Benth.	Hi 1948	Lombardo (MVJB 12878)	MH	EvDi	N	
<i>Rhynchosia senna</i> Gillies ex Hook. var. <i>senna</i>	Cu	–	MH	EvDi	N	LC
<i>Spartium junceum</i> L.	Cu	–	VDA	Shru	Ex–IAS	
<i>Trifolium subterraneum</i> L.	Cu	Zabaleta & Mendoza 187 (MVJB 32774)	MH	Ther	Ex	LC
<i>Ulex europaeus</i> L.	Cu	Mai et al. 905 (MVJB 33095)	MH	Suff	Ex–IAS	LC
<i>Vicia benghalensis</i> L.	Cu	Zabaleta et al. 355 (MVJB 33097)	VDA	Ther	Ex	
Gentianaceae Juss. (1)						
<i>Centaurium pulchellum</i> (Sw.) Druce	Cu	Marchesi 615 (MVFA)	MH	Ther	Ex	LC
Heliotropiaceae Schrad (1).						
<i>Heliotropium curassavicum</i> L.	Cu	Rosengurt B-4435 (MVM 8403)	HG	EvDi	N	LC
Hypericaceae Juss. (2)						
<i>Hypericum connatum</i> Lam.	Cu	Berro 3729 (MVFA)	NF	EvEr	N	
<i>Hypericum piriai</i> Arechav.	Hi 1956	Arrillaga 420 (MVFA)	–	EvEr	En – RE	Pr
Lamiaceae Martinov (4)						
<i>Glechon marifolia</i> Benth.	Cu	Berro 5039 (MVFA)	MH	EvDi	N	
<i>Salvia procurrens</i> Benth.	Cu	–	RH	EvDi	N	
<i>Teucrium cubense</i> Jacq.	Hi 1963	Marchesi 665 (MVFA)	–	EvEr	N	

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<i>Teucrium vesicarium</i> Mill.	Cu	Mai et al. 565 (MVJB 32643)	HG	SeGe	N	
Linaceae DC. ex Perleb (1)						
<i>Cliococca selaginoides</i> (Lam.) C.M.Rogers & Mildner	Cu	Nyffeler and Eggly 25063 (MVJB 25063)	RH	EvDi	N	
Loasaceae Juss. (1)						
<i>Blumenbachia insignis</i> Schrad.	Hi 1956	Arrillaga 451 (MVFA)	–	Ther	N	
Lythraceae J. St.-Hil. (1)						
<i>Cuphea glutinosa</i> Cham. & Schltdl.	Cu	Arechavaleta <i>s.n.</i> (MVM)	MH	EvEr	N	
Malvaceae Juss. (7)						
<i>Abutilon terminale</i> (Cav.) A.St.-Hil.	Cu	Marchesi 642 (MVFA)	MH	Suff	N	
<i>Krapovickasia flavescens</i> (Cav.) Fryxell	Cu	Reus <i>s.n.</i> (MVFA 10963)	RH, MH	EvDi	N	
<i>Modiola caroliniana</i> (L.) G.Don	Cu	Mai et al. 671 (MVJB 32647)	RH	EvDi	N	
<i>Pavonia aurigloba</i> Krapov. & Cristóbal	Cu	Berro 3754 (MVFA)	MH	Suff	N	
<i>Pavonia cymbalaria</i> A.St.-Hil. & Naudin	Cu	Del Puerto and Marchesi 3433 (MVFA)	MH	Suff	N	Pr
<i>Pavonia glechomoides</i> A.St.-Hil.	Cu	Arrillaga 453 (MVFA)	MH	EvDi	N	
<i>Sida spinosa</i> L.	Cu	Mai et al. 862 (MVJB 32648)	VDA	Suff	N	
Moraceae Gaudich. (1)						
<i>Dorstenia brasiliensis</i> Lam.	Cu	Nyffeler & Eggli <i>s.n.</i> (MVFA 24053)	RH	EvRo	N	
Myrtaceae Juss. (1)						
<i>Psidium salutare</i> (Humb., Bonpl. & Kunth) O. Berg var. <i>mucronatum</i> (Cambess.) Landrum	Cu	Berro 3741 (MVFA)	RH, MH	Suff	N	
Onagraceae Juss. (4)						
<i>Oenothera affinis</i> Cambess.	Hi 1948	Lombardo (MVJB 13088)	–	Ther	N	
<i>Oenothera indecora</i> Cambess.	Cu	Mai et al. 694 (MVJB 32650)	RH	Ther	N	
<i>Oenothera mollissima</i> L.	Cu	Mai et al. 901 (MVJB 33069)	RH	Ther	N	
<i>Oenothera parodiana</i> Munz	Hi 1907	Berro 3665 (MVFA)	–	Ther	N	
Orobanchaceae Vent (3).						
<i>Agalinis communis</i> (Cham. & Schltdl.) D'Arcy	Cu	Mai et al. 817 (MVJB 32744)	MH	Ther	N	
* <i>Agalinis digitalis</i> (Benth.) Barringer	Hi 1907	Berro 3610 (MVFA)	–	EvDi	En – Uy	Pr
<i>Bellardia trixago</i> (L.) All.	Cu	Mai et al. 906 (MVJB 33068)	MH	Ther	Ex	
Oxalidaceae R. Br. (6)						
<i>Oxalis articulata</i> Savign.	Cu	Mai & Fernández 411 (MVJB 32759)	RH	SeGe	N	
<i>Oxalis eriocarpa</i> DC.	Cu	Arechavaleta (MVM 713)	RH	EvDi	En – RE	
<i>Oxalis lasiopetala</i> Zucc.	Cu	Arechavaleta (MVM 1725)	MH	SeGe	N	
<i>Oxalis macachin</i> Arechav.	Cu	Izaguirre & Laguardia 247 (MVFA)	RH, MH	SeGe	En – RE	
<i>Oxalis perdicaria</i> (Molina) Bertero	Cu	Legrand 3925 (MVM)	RH	SeGe	N	
<i>Oxalis sellowiana</i> Zucc.	Cu	Legrand 3924 (MVM)	RH, MH	SeGe	En – RE	
Passifloraceae Juss. ex Roussel (1)						
<i>Passiflora caerulea</i> L.	Cu	Mai et al. 849 (MVJB 32745)	MH	Vein	N	
Pittosporaceae R. Br. (1)						
<i>Pittosporum undulatum</i> Vent.	Cu	–	MH	Shru	Ex–IAS	
Plantaginaceae Juss. (6)						
<i>Bacopa monnieri</i> (L.) Wettst.	Cu	Zabaleta et al. 358 (MVJB 33073)	HH	Ther	N	LC
<i>Plantago berroi</i> Pilg.	Cu	Nyffeler & Eggli <i>s.n.</i> (MVJB 24050)	RH, MH	EvRo	En – RE	Pr
<i>Plantago tomentosa</i> Lam.	Cu	Mai et al. 850 (MVJB 32746)	RH	EvRo	N	
<i>Scoparia montevidensis</i> (Spreng.) R.E.Fr.	Cu	Osten 3985 (MVM)	RH	EvDi	N	
<i>Veronica peregrina</i> L.	Hi 1937	Lombardo 2846 (MVJB)	–	Ther	Ex	LC
Plumbaginaceae Juss. (1)						
<i>Limonium brasiliense</i> (Boiss.) Kuntze	Cu	Rosengurtt B- 4439 (MVM 7967)	RH	SeGe	N	

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Polygalaceae Hoffmanns. & Link (6)						
<i>Monnina cuneata</i> A.St.-Hil.	Cu	Berro 5063 (MVFA)	RH	Suff	En – RE	
<i>Polygala australis</i> A.W.Benn.	Cu	Marchesi et al. (MVJB 33076)	MH, RH	Ther	N	
<i>Polygala bonariensis</i> Grondona	Hi 1956	Arrillaga 453 (MVFA)	–	SeXy	N	
<i>Polygala cyparissias</i> A. St.-Hil. & Moq.	Hi 1963	Marchesi 663 (MVFA)	–	EvDi	N	
<i>Polygala linoides</i> Poir. var. <i>linoides</i>	Cu	Mai et al. 900 (MVJB 33078)	RH, MH	SeXy	N	
<i>Polygala resedoides</i> A. St.-Hil. & Moq.	Cu	Mai et al. s.n. (MVJB 33207)	RH, MH	SeXy	N	
Polygonaceae Juss. (1)						
<i>Rumex cuneifolius</i> Campd.	Cu	Rosengurtt B-4467 (MVFA)	RH	SeGe	N	
Portulacaceae Juss. (2)						
<i>Portulaca cryptopetala</i> Speg.	Cu	Mai et al. 852 (MVJB 32747)	RH	EvDi	N	
<i>Portulaca grandiflora</i> Hook.	Cu	Chebataroff 5303 (MVM)	RH	EvDi	N	
Primulaceae Batsch (4)						
<i>Anagallis arvensis</i> L.	Cu	Mai et al. 818 (MVJB 32749)	MH	Ther	Ex	
<i>Myrsine coriacea</i> (Sw.) R.Br.	Cu	Lombardo (MVJB 12029)	MH	Tree	N	
<i>Myrsine laetevirens</i> (Mez) Arechav.	Cu	Mai et al. 844 (MVJB 32748)	NF	Tree	N	
<i>Samolus valerandi</i> L.	Cu	Fernández et al. <i>s.n.</i> (MVJB 32661)	HuC	Ther	N	LC
Ranunculaceae Juss. (2)						
<i>Anemone decapetala</i> Ard.	Cu	–	RH, MH	SeGe	N	
<i>Ranunculus platensis</i> Spreng.	Hi 1937	Lombardo 2371 (MVJB)	–	Ther	N	
Rhamnaceae Juss. (3)						
<i>Colletia paradoxa</i> (Spreng.) Escalante	Cu	Arechavaleta <i>s.n.</i> (MVM)	RH	Shru	N	
<i>Discaria americana</i> Gill. & Hook.	Cu	Mai et al. 912	RH	Suff	N	
<i>Scutia buxifolia</i> Reissek	Cu	Mai et al. 859 (MVJB 32750)	NF	Tree	N	LC
Rubiaceae Juss. (11)						
<i>Borreria dasycephala</i> (Cham. & Schltdl.) Bacigalupo & E.L.Cabral	Hi 1903	Arechavaleta <i>s.n.</i> (MVM)	–	EvDi	N	
<i>Galianthe centranthoides</i> (Cham. & Schltdl.) E.L.Cabral	Cu	Marchesi (MVFA 7298)	RH, MH	Suff	N	
<i>Galianthe fastigiata</i> Griseb	Cu	Lombardo 6059 (MVJB)	NF	Suff	N	
<i>Galium ericoides</i> Lam.	Cu	Osten 3883 (MVM)	RH	Suff	En – RE	
<i>Galium hirtum</i> Lam.	Cu	Mai et al. 834 (MVJB 32751)	MH	Ther	N	
<i>Galium hypocarpium</i> Endl. ex Griseb.	Cu	Osten 3869 (MVM)	MH	EvDi	N	
<i>Galium uruguayense</i> Bacigalupo var. <i>echinulatus</i> Bacigalupo	Cu	Mai et al. 759 (MVJB 32664)	MH	EvDi	En – RE	Pr
<i>Mitracarpus megapotamicus</i> Kuntze	Cu	Marchesi 646 (MVFA)	MH, RH	EvDi	N	
<i>Richardia brasiliensis</i> Gomez	Cu	Legrand 3127 (MVM)	MH, RH	Ther	N	
<i>Richardia humistrata</i> Steud.	Cu	Del Puerto & Marchesi (MVFA 3429)	MH, RH	EvDi	N	
<i>Richardia stellaris</i> Steud.	Cu	–	MH, RH	EvDi	N	
Sapindaceae Juss. (1)						
<i>Dodonaea viscosa</i> Jacq.	Cu	Osten 3872 (MVM)	NF	Shru	Co	LC
Scrophulariaceae Juss. (1)						
<i>Verbascum virgatum</i> Stokes	Cu	Mai et al. 911 (MVJB 33079)	VDA	Ther	Ex	
Solanaceae Juss. (12)						
<i>Bouchetia anomala</i> (Miers) Britton & Rusby	Cu	Lombardo 2203 (MVJB)	RH	SeXy	N	
<i>Cestrum euanthes</i> Schltdl.	Hi 1956	Arrillaga 443 (MVFA)	–	Shru	N	
<i>Nicotiana bonariensis</i> Lehm.	Cu	Arrillaga 438 (MVFA)	VDA	Ther	N	
<i>Nicotiana longiflora</i> Cav.	Cu	–	MH	SeXy	N	

Group / Family / Species name	Type record	Reference voucher	Veg. type	Life form	Origin	Status
<i>Petunia axillaris</i> (Lam.) Britton, Sterns & Poggenb.	Cu	Arrillaga et al. 2069 (MVFA)	RH	EvDi	N	
<i>Salpichroa organifolia</i> (Lam.) Baill.	Cu	Mai et al. 858 (MVJB 32753)	RH, MH	EvDi	N	
<i>Solanum chenopodioides</i> Lam.	Cu	–	MH	Suff	N	
<i>Solanum commersonii</i> Poir.	Cu	Ren s.n. (MVFA 10961)	MH	SeGe	N	
<i>Solanum mauritianum</i> Scop.	Cu	Fernández et al. s.n. (MVJB 32668)	NF	Shru	N	
<i>Solanum pseudocapsicum</i> L.	Hi 1907	Berro 3659 (MVFA)	–	Suff	N	
<i>Solanum sarrachoides</i> Sendtn.	Hi 1943	Rosengurtt B 4437 (MVFA)	HH	Ther	N	
<i>Solanum sisymbriifolium</i> Lam.	Cu	Mai et al. 864 (MVJB 32754)	RH, MH	Suff	N	
Turneraceae Kunth ex DC. (1)						
<i>Turnera sidoides</i> L.	Cu	Mai et al. 706 (MVJB 32669)	MH	EvDi	N	
Verbenaceae J. St.-Hil. (8)						
<i>Glandularia</i> aff. <i>platensis</i> (Spreng.) Schnack & Covas	Cu	–	MH	EvDi	N	
<i>Glandularia selloi</i> (Spreng.) Tronc.	Cu	Del Puerto & Marchesi (MVFA 5222)	MH	EvDi	En – RE	
<i>Lantana camara</i> L.	Cu	Berro 3619 (MVFA)	NF	Shru	N	
<i>Phyla nodiflora</i> (L.) Greene var. <i>minor</i>	Cu	Mai & Pollero 922 (MVJB 33063)	MH	EvDi	N	
<i>Verbena bonariensis</i> L. var. <i>bonariensis</i>	Cu	Mai & Zarucki 914 (33208)	VDA	SeGe	N	
<i>Verbena intermedia</i> Gill. & Hook.	Cu	Mai & Pollero 933 (MVJB 33209)	MH	SeGe	N	
<i>Verbena montevidensis</i> Spreng.	Cu	Mai et al. 869 (MVJB 32670)	MH	Suff	N	
<i>Verbena rigida</i> Spreng.	Cu	Mai et al. 870 (MVJB 32671)	MH	SeGe	N	
Violaceae Batsch (1)						
<i>Pombalia parviflora</i> (Mutis ex L.f.) Paula-Souza	Cu	Lombardo 3070 (MVJB)	RH	EvDi	N	

‘Rupicolous’ and ‘mesophilic herblands’ were the vegetation types with the highest number of species, maintaining 35% and 34% of the flora, respectively. A high number of species could develop in both vegetation types (48 species, 13%) as well. These were followed by ‘hydrophilic herblands’ (25 species, ca 7%) and ‘halophilic grasslands’ (13 species, ca 3%), ‘humid rocky shelters communities’ showed less significance with 4 species (<1%). ‘Native forest patches’ and ‘vegetation of disturbed areas’ on the sides of the access road reached 12 and 13 species respectively (ca 3% each).

Endemisms and threatened species

Punta Ballena supported a high number of threatened and priority species for conservation, as well as endemisms, summing up 74 taxa, 17% of the site flora (Table 2, Fig. 4). According to IUCN criteria, *Cypella osteniana*, is considered **endangered** (Paz Deble et al. 2021) and five species are **vulnerable**: *Oxypetalum marchesii* (González et al. 2018) along with four Cacti: *Parodia concinna*, *P. ottonis*, *P. scopa* and *Parodia sellowii* (it should be noted that *Parodia tabularis*, was not evaluated by IUCN). A total of 33 taxa were considered **priority for conservation in the country** and 64 were identified as **endemic**: 48 regional endemisms, 13 with a restricted distribution within Uruguay and two local endemisms from Punta Ballena: *Senecio ostenii* var. *balaenicus* and *Parodia tabularis* (Table 2, Fig. 4).

Despite the fact that several historically documented taxa were currently confirmed in the site, 14% of the total taxa had not been registered in recent years. Applying a precautionary principle, these taxa were kept on the species list. Due to the lack of exact data from the collection sites of some historic specimens, as well as the urban development of the site (which has led to the loss of native environments and their vegetation), these taxa could either be present with diminished populations or be locally extinct. In this sense, we confirm five species as locally extinct: *Oxypetalum nigricans*, *Gyptis commersonii*, *Gyptis tanacetifolia*, *Agalinis digitalis* and *Parodia mammulosa* (Table 2, Fig. 5).

Discussion

Punta Ballena stands out because of its high plant diversity (427 spp), especially considering that only 20 ha. are currently in a natural state. This species list corresponds to 15% of the total flora of the country (2756 spp, Marchesi et al. 2013). The particular geological characteristics of the site, where geological materials of different origins converge (Goso and Muzio 2006; Spoturno et al. 2012), and the continuity of the hill environment towards the sea, have surely allowed the development of this varied flora.

The most species-rich families, Asteraceae and Poaceae, followed by Fabaceae, coincide in being the families with the highest species richness for the country and dominate the “Rio de la Plata grasslands” ecoregion, where Uruguay is located (Andrade et al. 2018). Also, other numerous families of Punta Ballena, are characteristic of this ecoregion, such as Cyperaceae, Solanaceae and Rubiaceae. The importance of Cactaceae and Cyperaceae in this site is highlighted, first because they are species that grow between and over rocks, and second because its species grow in humid environments, with permanent or temporary accumulation of water, which occurs in some sectors of the rocky point.

The projection of the rocky environment into the la Plata River, and the presence of several microhabitats allow the development of different vegetation types at the site (Figs 1C, 2). This vegetation diversity found on the rocky point sustains species with different habitat affinities, such as rupestrian and epilithic species in rupicolous herblands, halophyte species either in rupicolous herblands influenced by the sea or in halophilic grasslands, and a combination of grass and herbs in mesophilic herblands (dominated by Asteraceae, Fabaceae and Poaceae spp.). As expected for the preponderant vegetation, herbs were dominant in this flora with a major representation of perennials. They have developed several strategies to grow in this environment; in this sense rosettes and prostrate or decumbent habits were widely recorded, as well as specialized subterranean structures such as xylopodia, bulbs, rhizomes or thickened stems and roots. Species that develop in halophytic grasslands exhibit adaptations to live in saline environments, such as succulent leaves, salt excretory glands, and the ability to maintain a relatively high osmotic pressure in their tissues due to salt accumulation (Chebataroff 1936, 1950; Legrand 1959). Shrubs and suffrutex are also common, being habits developed by species that in

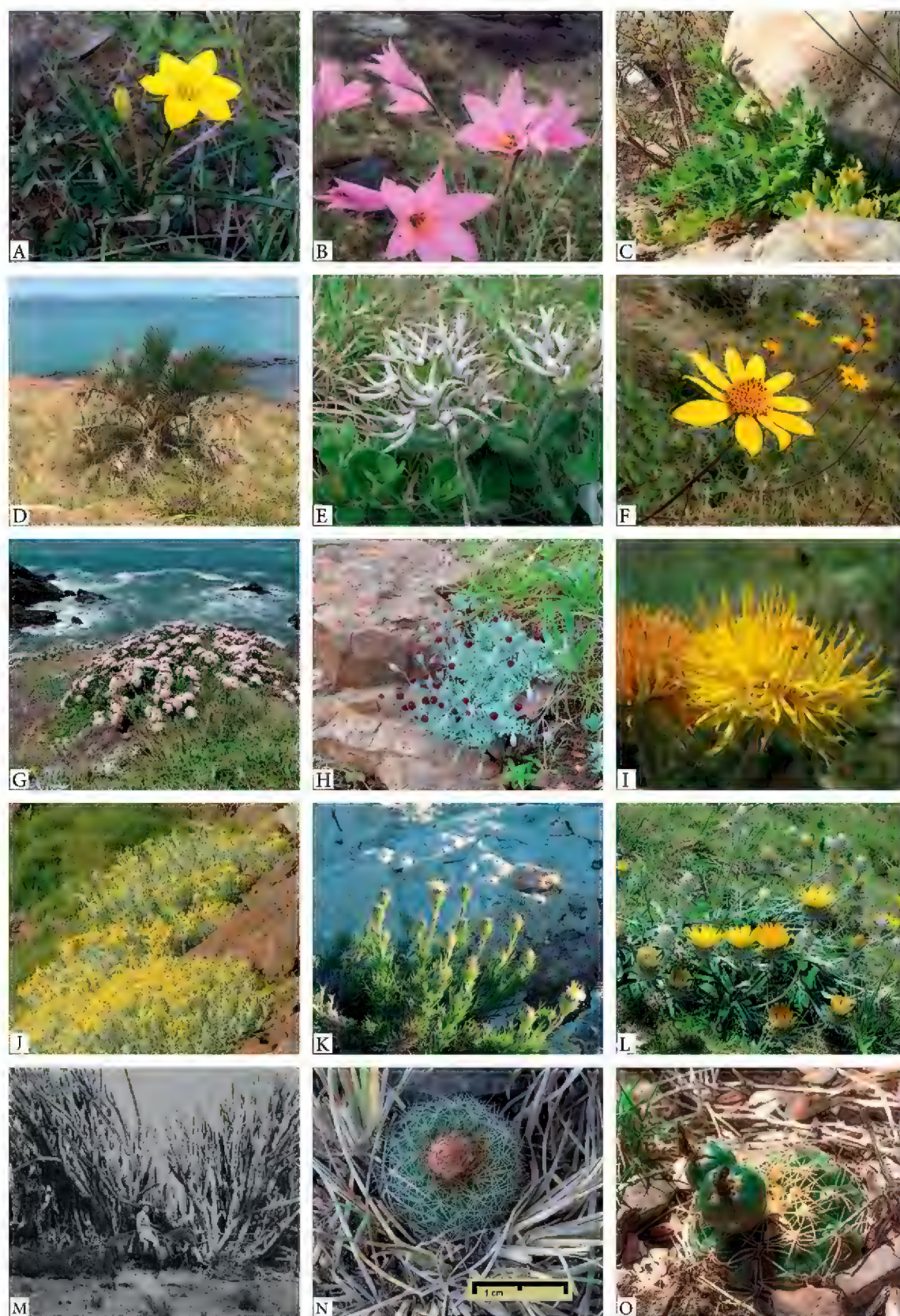


Figure 4. Priority for conservation and threatened species from Punta Ballena. Amaryllidaceae: **A:** *Beauverdia hirtella*, **B:** *Zephyranthes estensis*. Apiaceae: **C:** *Apium prostratum*. Arecaceae: **D:** *Butia odorata*. Asclepiadaceae: **E:** *Oxypetalum marchesii*. Asteraceae: **F:** *Aldama nudicaulis*, **G:** *Grazielia brevipetiolata*, **H:** *Porophyllum brevifolium*, **I:** *Schlechtendalia luzulaefolia*, **J:** *Senecio ostenii* var. *balaenicus*, **K:** *Sommerfeltia spinulosa*, **L:** *Trichocline incana*. Cactaceae: **M:** *Cereus uruguayanus* historic photo, taken from the herbarium specimen Osten 16506 (MVM), **N:** *Frailea pygmaea*, **O:** *Gymnocalycium hyptiacanthum*, **P:** *Opuntia arechavaletae*, **Q:** *Parodia concinna*, **R:** *Parodia ottonis*, **S:** *Parodia scopa*, **T:** *Parodia sellowii*, **U:** *Parodia tabularis*, **V:** flower detail of *Parodia tabularis*. Caryophyllaceae: **W:** *Spergularia rupestris*. Crassulaceae: **X:** *Crassula caudiculata*. Cyperaceae: **Y:** *Carex vixdentata*, **Z:** *Eleocharis montevidensis*. Euphorbiaceae: **Aa:** *Croton nitrariifolius*. Fabaceae: **Ab:** *Mimosa amphigena* var. *trachycarpoides*, **Ac:** *Mimosa reptans*. Iridaceae: **Ad:** *Cypella osteniana*, **Ae:** *Sisyrinchium rosengurtii*. Malvaceae: **Af:** *Pavonia cymbalaria*. Orchidaceae: **Ag:** *Bipinnula gibertii*, **Ah:** *Bipinnula montana*. Poaceae: **Ai:** *Echinochloa polystachya* var. *spectabilis*. (H, S, Y and Ac-S. Fernández Photos).

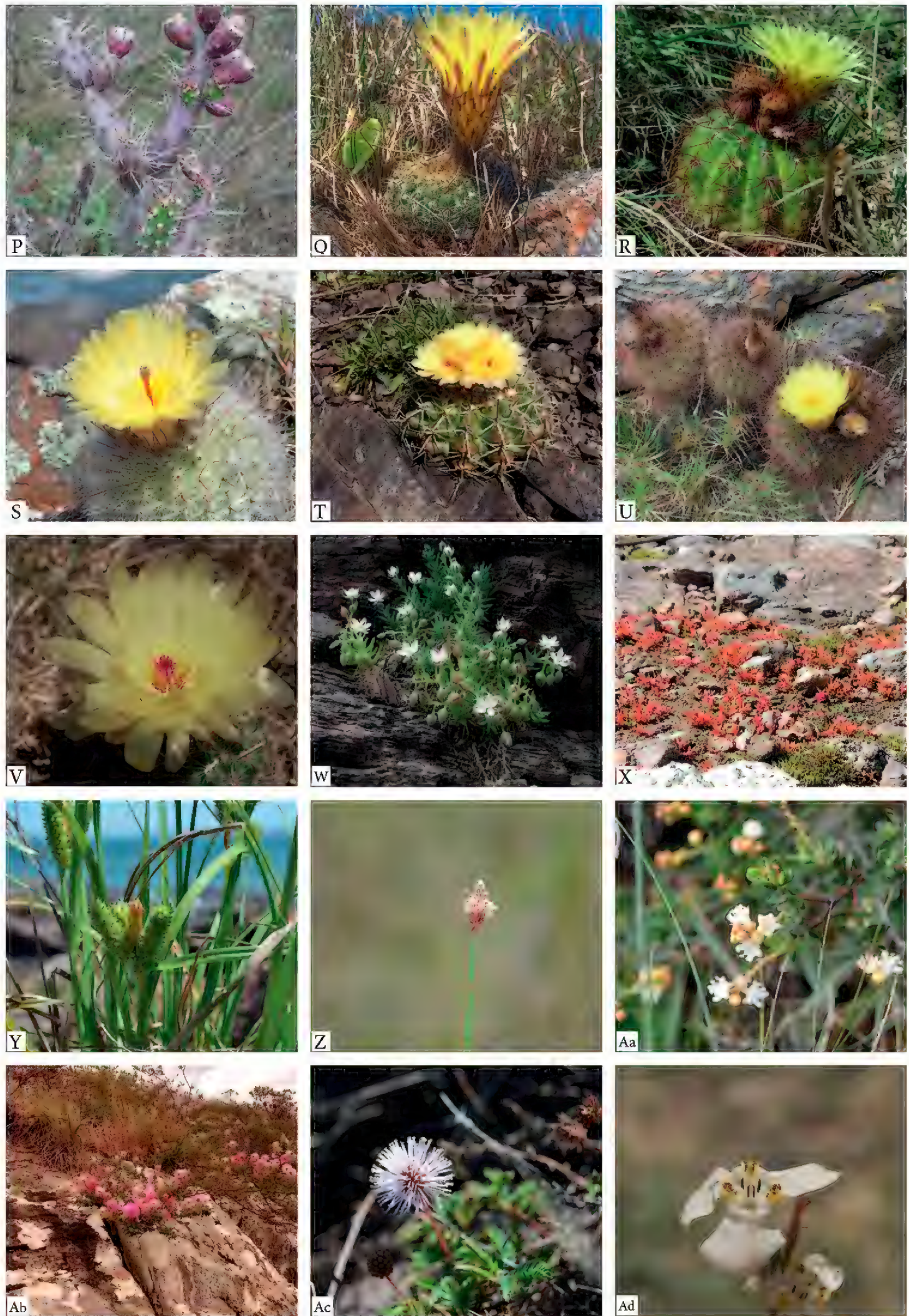


Figure 4. Continued.



Figure 4. Continued.

other environments acquire greater size but here, grow in a squat and prostrate way. A frequent adaptation to the rocky environment is succulence; in this site Cacti stands out for developing succulent, globose or cladode stems.

Regarding historical collections from the site, to date Punta Ballena has suffered a loss of 14% of its species. This fact is likely a direct consequence of the urban development of the site in recent decades. Even, from the historically documented species, we consider five species to be locally extinct: *Oxypetalum nigricans*, *Gyptis commersonii*, *Gyptis tanacetifolia*, *Agalinis digitalis* and *Parodia mammulosa* (Fig. 5). For all these taxa there was a reduction of their typical environments and in those that remain they were not found. In turn, during the continuous surveys we could confirm that some species showed severely diminished populations such as: *Frailea pygmaea*, *Gymnocalycium hyptiacanthum* and *Lathyrus subulatus*, with scarce individuals or populations in the area. Specifically, in relation to Cacti, in addition to verifying the absence of *Parodia mammulosa*, we note a decrease in the abundance of all Cactaceae species, probably as a consequence of illegal collection.

The site supports five **vulnerable** and one **endangered species** (IUCN), numerous **priority species for conservation in Uruguay**, two local endemisms and numerous national and regional endemisms (Table 2). Most of the **priority species** are widely distributed along the rocky point: e.g. *Apium prostratum*; *Aldama nudicaulis*, *Grazielia brevipetiolata*, *Porophyllum brevifolium*, *Schlechtendalia luzulaefolia*, *Sommerfeltia spinulosa*, *Trichocline incana*; *Spergularia rupestris*; *Croton nitrariifolius*; *Sisyrinchium rosengurtii*; *Pavonia cymbalaria*; *Jarava juncoides* and *Nassella pauciciliata*. Moreover, among the endemic taxa, the **regional endemisms** denote the mixture of campestre species with subtropical species that show atlantic

or paranaense affinity: e.g. *Beauverdia sellowiana*, *B. vittata*; *Aldama nudicaulis*, *Baccharis patens*; *Frailea pygmaea*, *Parodia concinna*, *P. mammulosa*, *P. scopa*; *Mimosa ramulosa*, *M. reptans*; *Herbertia pulchella*; *Bipinnula gibertii* and *B. montana*. The taxa with a restricted distribution within Uruguay could be found throughout the rocky point, e.g. *Beauverdia hirtella* and *Zephyranthes estensis*; *Oxypetalum marchesii*; *Grazielia brevipetiolata*, *Porophyllum brevifolium*; *Spergularia rupestris*; *Mimosa amphigena* var. *trachycarpoides*; *Cypella osteniana*; *Nassella pauciciliata*; among others. Finally, two **local endemisms** from Punta Ballena are present at the site: *Senecio ostenii* var. *balaenicus* and *Parodia tabularis* (as was previously mentioned, the latter has shown a reduction in its population each year).

Most of the species were native, while exotic species represented 13% of this flora. Many of them (11 species) were considered IAS for the country (Masciadri et al. 2010). *Carpobrotus edulis* is of greater concern in the site, because it is locally spreading in the rupicolous communities of the rocky point. Another IAS at the site is *Cynodon dactylon*, which develops a dense tapestry in some sectors of the mesophilic herbland, especially near parking lots or in places prone to be altered or disturbed. *Pittosporum undulatum* is mostly found on the sides of the access road, while *Ulex europaeus* was locally restricted to a sector of the rocky point. The remaining IAS coexist with native species integrating the different types of vegetation. All these species represent a threat for the vegetation, the diverse flora of Punta Ballena and the numerous species of interest for conservation. Masciadri et al. (2010) suggested that rapid actions be carried out to control IAS specially in coastal departments of Uruguay, not only to reduce the negative impacts on coastal ecosystems, but also to mitigate the economic losses related to IAS that could happen in a locality that relies on tourism.

The highly diverse flora of Punta Ballena, as well as the documented presence of numerous taxa with interest for conservation and endemisms on a reduced surface, justify the urgent need for protection of the site. It is especially necessary to regulate common actions that occur on the natural area of the rocky point, such as cutting grass and herbs on the sides of the access road (that reduce natural populations of some native species, in contrast to adventitious and exotic ones); vehicular traffic or irregular parking in areas with vegetation or rocks (that not only affects plants but also the fauna associated with it); restrict the parking surface (that has increased in recent years); and finally take actions to avoid the illegal extraction of specimens of cactus and other species by visitors. In relation to the urbanized area, the projection of an urban advance in natural remnants, would lead to the extinction of numerous species, many of which have previously been classified as priority for conservation or under IUCN threat categories. Additionally, it is necessary to regulate the types of plants used in gardens and for green roofs, since several species commonly used are exotic and IAS, and represent a threat to the native vegetation of the site.

Some recommendations to promote the conservation of the area: in the private area, all non-developed private spaces should not be intervened with, the natural vegetation of the place should be promoted and maintained, and land leveling or other modifications of the natural terrain should not be allowed. In the public natural area, it is necessary to take actions to regulate traffic and irregular parking in ar-

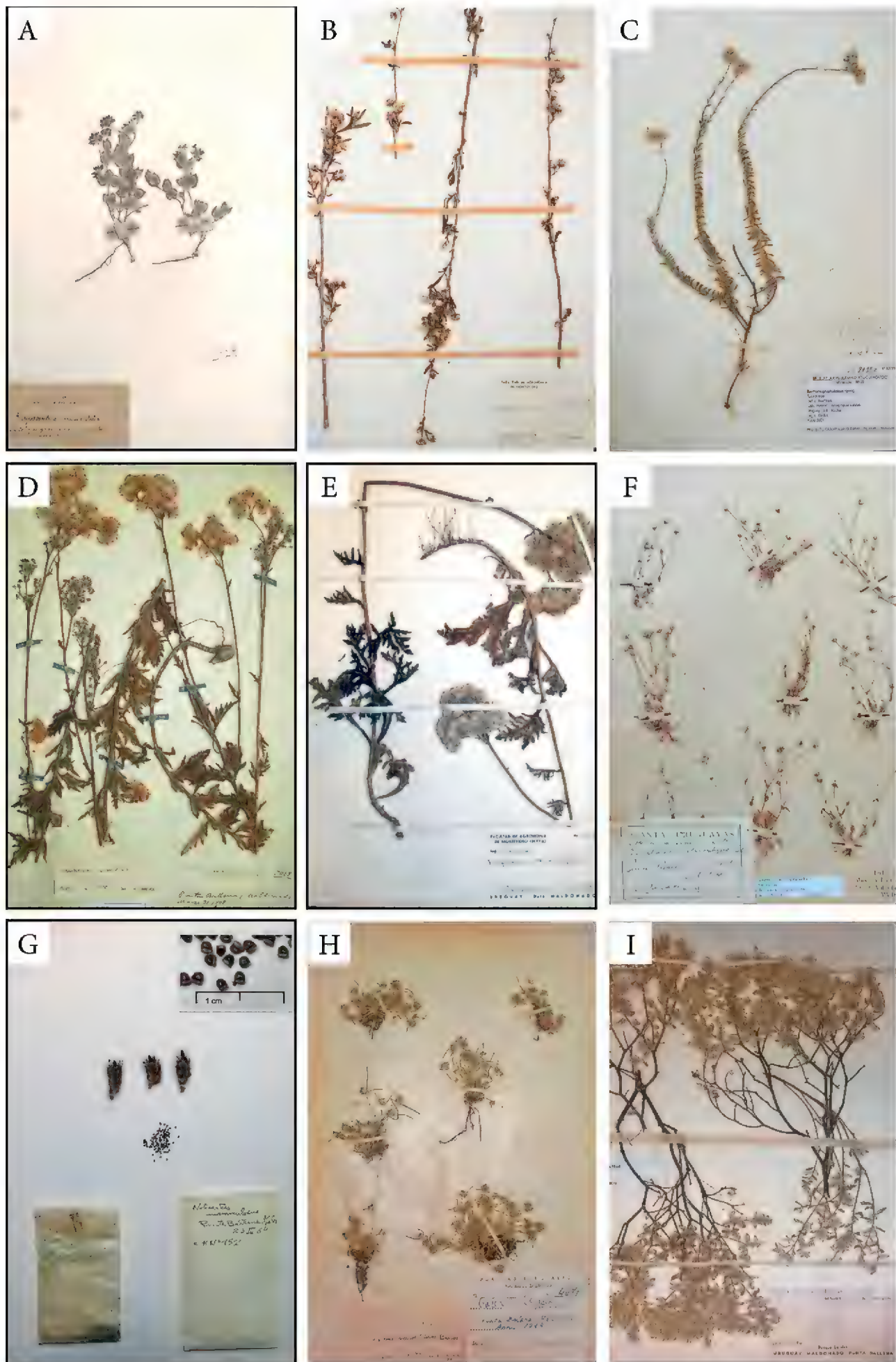


Figure 5. Species with historic record for Punta Ballena, considered regional and Uruguayan endemisms or priority for conservation for the country. Black box indicates species locally extinct. Asclepiadaceae: **A:** *Oxypetalum nigricans*. Asteraceae: **B:** *Baccharis arenaria*; **C:** *Baccharis gnaphalioides*; **D:** *Gyptis commersonii*; **E:** *Gyptis tanacetifolia*; **F:** *Panphalea heterophylla*. Cactaceae: **G:** *Parodia mammulosa*. Cyperaceae: **H:** *Cyperus berroi*. Euphorbiaceae: **I:** *Croton chamaepitys*. Hypericaceae: **J:** *Hypericum piriai*. Orobanchaceae: **K:** *Agalinis digitalis*. Poaceae: **L:** *Jarava juncoides*; **M:** *Aristida filifolia*; **N:** *Aristida murina*; **O:** *Aristida teretifolia*; **P:** *Danthonia rhizomata*; **Q:** *Digitaria enodis*; **R:** *Piptochaetium confusum*.

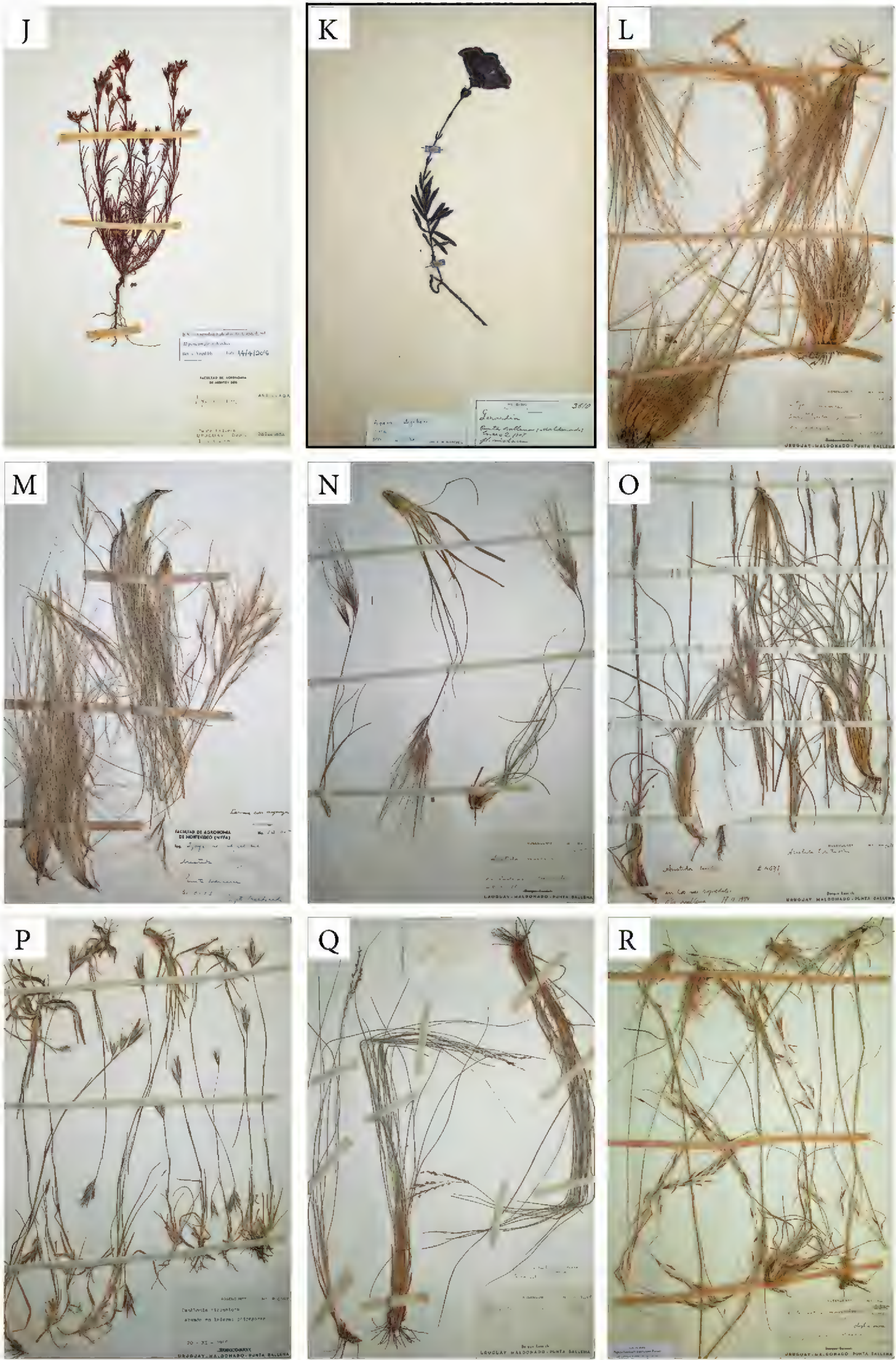


Figure 5. Continued.

eas where there is vegetation, and avoid or minimize the cutting of grass. Additionally, boardwalks with explanatory and informative signs should be incorporated, and a species protection site should be promoted in this particular area, given that it is a hotspot on the coast of Uruguay.

Conclusions

Our work highlights the floristic importance of the emblematic coastal site of Punta Ballena. We consider the natural area of this rocky point as a plant hotspot, because it supports an exceptionally high flora and nourishes a significant number of endemic, priority for conservation and threatened species. The loss or decrease in surface area of this natural space would seriously endanger the existence of all these species. From a conservation perspective, we hope this work lays the foundation to generate conservation plans for the site and for the future definition of actions and responsibilities.

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